

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	279°01.7'	179°02.8'	N 23°07.2'	210°58.0'	N 20°31.3'	271°38.9'	N 1°46.8'	311°36.6'	S 14°25.2'	253°18.4'	N 8°42.6'			
1	294°04.2'	194°02.6'	N 23°07.1'	225°57.3'	N 20°31.9'	286°41.2'	N 1°46.9'	326°39.2'	S 14°25.2'	268°19.2'	N 8°43.3'			
2	309°06.7'	209°02.5'	N 23°06.9'	240°56.6'	N 20°32.4'	301°43.5'	N 1°46.9'	341°41.7'	S 14°25.2'	283°20.0'	N 8°43.9'			
3	324°09.1'	224°02.4'	N 23°06.7'	255°56.0'	N 20°32.9'	316°45.7'	N 1°47.0'	356°44.3'	S 14°25.3'	298°20.8'	N 8°44.5'			
4	339°11.6'	239°02.3'	N 23°06.6'	270°55.3'	N 20°33.5'	331°48.0'	N 1°47.1'	11°46.8'	S 14°25.3'	313°21.6'	N 8°45.2'			
5	354°14.1'	254°02.2'	N 23°06.4'	285°54.6'	N 20°34.0'	346°50.2'	N 1°47.2'	26°49.4'	S 14°25.4'	328°22.4'	N 8°45.8'			
6	9°16.5'	269°02.0'	N 23°06.2'	300°53.9'	N 20°34.5'	1°52.5'	N 1°47.2'	41°52.0'	S 14°25.4'	343°23.2'	N 8°46.4'			
7	24°19.0'	284°01.9'	N 23°06.1'	315°53.2'	N 20°35.1'	16°54.8'	N 1°47.3'	56°54.5'	S 14°25.4'	358°24.0'	N 8°47.1'			
8	39°21.5'	299°01.8'	N 23°05.9'	330°52.6'	N 20°35.6'	31°57.0'	N 1°47.4'	71°57.1'	S 14°25.5'	13°24.8'	N 8°47.7'			
9	54°23.9'	314°01.7'	N 23°05.7'	345°51.9'	N 20°36.1'	46°59.3'	N 1°47.5'	86°59.6'	S 14°25.5'	28°25.6'	N 8°48.3'			
10	69°26.4'	329°01.6'	N 23°05.6'	0°51.2'	N 20°36.6'	62°01.6'	N 1°47.5'	102°02.2'	S 14°25.6'	43°26.4'	N 8°49.0'			
11	84°28.8'	344°01.4'	N 23°05.4'	15°50.5'	N 20°37.2'	77°03.8'	N 1°47.6'	117°04.8'	S 14°25.6'	58°27.2'	N 8°49.6'			
12	99°31.3'	359°01.3'	N 23°05.2'	30°49.8'	N 20°37.7'	92°06.1'	N 1°47.7'	132°07.3'	S 14°25.7'	73°28.0'	N 8°50.3'			
13	114°33.8'	14°01.2'	N 23°05.0'	45°49.2'	N 20°38.2'	107°08.4'	N 1°47.8'	147°09.9'	S 14°25.7'	88°28.8'	N 8°50.9'			
14	129°36.2'	29°01.1'	N 23°04.9'	60°48.5'	N 20°38.7'	122°10.6'	N 1°47.8'	162°12.4'	S 14°25.7'	103°29.6'	N 8°51.5'			
15	144°38.7'	44°00.9'	N 23°04.7'	75°47.8'	N 20°39.2'	137°12.9'	N 1°47.9'	177°15.0'	S 14°25.8'	118°30.4'	N 8°52.2'			
16	159°41.2'	59°00.8'	N 23°04.5'	90°47.1'	N 20°39.8'	152°15.1'	N 1°48.0'	192°17.6'	S 14°25.8'	133°31.1'	N 8°52.8'			
17	174°43.6'	74°00.7'	N 23°04.3'	105°46.4'	N 20°40.3'	167°17.4'	N 1°48.0'	207°20.1'	S 14°25.9'	148°31.9'	N 8°53.4'			
18	189°46.1'	89°00.6'	N 23°04.2'	120°45.7'	N 20°40.8'	182°19.7'	N 1°48.1'	222°22.7'	S 14°25.9'	163°32.7'	N 8°54.1'			
19	204°48.6'	104°00.5'	N 23°04.0'	135°45.1'	N 20°41.3'	197°21.9'	N 1°48.2'	237°25.3'	S 14°25.9'	178°33.5'	N 8°54.7'			
20	219°51.0'	119°00.3'	N 23°03.8'	150°44.4'	N 20°41.8'	212°24.2'	N 1°48.3'	252°27.8'	S 14°26.0'	193°34.3'	N 8°55.3'			
21	234°53.5'	134°00.2'	N 23°03.6'	165°43.7'	N 20°42.3'	227°26.5'	N 1°48.3'	267°30.4'	S 14°26.0'	208°35.1'	N 8°55.9'			
22	249°56.0'	149°00.1'	N 23°03.5'	180°43.0'	N 20°42.9'	242°28.7'	N 1°48.4'	282°32.9'	S 14°26.1'	223°35.9'	N 8°56.6'			
23	264°58.4'	163°00.0'	N 23°03.3'	195°42.3'	N 20°43.4'	257°31.0'	N 1°48.5'	297°35.5'	S 14°26.1'	238°36.7'	N 8°57.2'			
		SD 15.7' d -0.2'		v -0.7' d 0.5'		v 2.3' d 0.1'		v 2.6' d -0.0'		v 0.8' d 0.6'				
Mer. pass.		12 h 3 m 55 s		9 h 57 m		5 h 53 m		3 h 13 m		7 h 6 m				

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Antares	-Rigel Kent	-Acrux	-Spica	-Arcturus	-Regulus	+Pollux	+Procyon
0	156°05.5'	N 24°51.5'	11.3'	-5.5'	54.0'			115°04.6'	101°19.2'	84°40.4'	83°10.4'	30°43.4'	6°25.4'
1	170°35.8'	N 24°46.0'	11.4'	-5.6'	54.0'			114°44.4'	101°02.2'	84°10.8'	82°44.3'	30°14.1'	6°53.5'
2	185°06.2'	N 24°40.4'	11.4'	-5.8'	54.0'			114°24.1'	100°45.1'	83°41.3'	82°18.3'	29°44.8'	7°21.7'
3	199°36.6'	N 24°34.6'	11.5'	-5.9'	54.0'			114°03.8'	100°28.0'	83°11.7'	81°52.2'	29°15.5'	7°50.2'
4	214°07.1'	N 24°28.7'	11.5'	-6.0'	54.0'			113°43.4'	100°10.8'	82°42.1'	81°26.1'	28°46.2'	8°18.8'
5	228°37.6'	N 24°22.7'	11.6'	-6.1'	54.0'			113°23.0'	99°53.6'	82°12.4'	81°00.1'	28°16.9'	8°47.5'
6	243°08.2'	N 24°16.6'	11.6'	-6.2'	54.0'			113°02.5'	99°36.4'	81°42.8'	80°34.0'	27°47.6'	9°16.3'
7	257°38.8'	N 24°10.4'	11.6'	-6.3'	54.1'			112°41.9'	99°19.1'	81°13.2'	80°08.0'	27°18.4'	9°45.3'
8	272°09.4'	N 24°04.1'	11.7'	-6.4'	54.1'			112°21.3'	99°01.8'	80°43.6'	79°41.9'	26°49.1'	10°14.3'
9	286°40.1'	N 23°57.6'	11.7'	-6.6'	54.1'			112°00.6'	98°44.5'	80°13.9'	79°15.9'	26°19.9'	10°43.3'
10	301°10.9'	N 23°51.1'	11.8'	-6.7'	54.1'			111°39.8'	98°27.2'	79°44.3'	78°49.8'	25°50.6'	11°12.5'
11	315°41.6'	N 23°44.4'	11.8'	-6.8'	54.1'			111°19.0'	98°09.8'	79°14.6'	78°23.8'	25°21.4'	11°41.7'
12	330°12.5'	N 23°37.6'	11.9'	-6.9'	54.1'			110°58.1'	97°52.4'	78°45.0'	77°57.8'	24°52.2'	12°10.9'
13	344°43.4'	N 23°30.8'	11.9'	-7.0'	54.1'			110°37.2'	97°34.9'	78°15.3'	77°31.8'	24°23.0'	12°40.2'
14	359°14.3'	N 23°23.8'	12.0'	-7.1'	54.1'			110°16.2'	97°17.4'	77°45.6'	77°05.8'	23°53.8'	13°09.6'
15	13°45.3'	N 23°16.7'	12.0'	-7.2'	54.1'			109°55.2'	96°60.0'	77°16.0'	76°39.8'	23°24.6'	13°39.0'
16	28°16.3'	N 23°09.5'	12.1'	-7.3'	54.1'			109°34.1'	96°42.4'	76°46.3'	76°13.8'	22°55.4'	14°08.4'
17	42°47.3'	N 23°02.2'	12.1'	-7.4'	54.1'			109°13.0'	96°24.9'	76°16.6'	75°47.8'	22°26.3'	14°37.8'
18	57°18.5'	N 22°54.8'	12.2'	-7.5'	54.2'			108°51.8'	96°07.3'	75°46.9'	75°21.8'	21°57.2'	15°07.3'
19	71°49.6'	N 22°47.2'	12.2'	-7.6'	54.2'			108°30.5'	95°49.7'	75°17.1'	74°55.8'	21°28.1'	15°36.8'
20	86°20.8'	N 22°39.6'	12.3'	-7.7'	54.2'			108°09.3'	95°32.1'	74°47.4'	74°29.9'	20°59.0'	16°06.3'
21	100°52.1'	N 22°31.9'	12.3'	-7.8'	54.2'			107°47.9'	95°14.5'	74°17.7'	74°03.9'	20°29.9'	16°35.9'
22	115°23.4'	N 22°24.1'	12.4'	-7.9'	54.2'	119°41.6'		107°26.5'	94°56.8'	73°48.0'	73°38.0'	20°00.9'	17°05.5'
23	129°54.8'	N 22°16.1'	12.4'	-8.0'	54.2'	119°11.8'		107°05.1'	94°39.1'	73°18.2'	73°12.0'	19°31.9'	17°35.1'
Mer. pass.		14 h 3 m SD 14.7'		phase 3%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.7'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.7'	N 7°24.7'
Deneb	+1.2	49°26.8'	N 45°21.5'	Acrux	+0.8	173°02.4'	S 63°13.6'	Capella	+0.1	280°25.4'	N 46°01.1'
Altair	+0.8	62°01.7'	N 8°55.6'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.2'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.3'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°18.0'	N 89°21.2'
Rigel Kent	-0.0	139°42.8'	S 60°55.8'	Adhara	+1.5	255°07.9'	S 29°00.1'	Achernar	+0.5	335°22.0'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.8'				
Hadar	+0.6	148°38.7'	S 60°29.1'	Canopus	-0.6	263°53.9'	S 52°42.4'				

h	Aries			Sun			Venus			Jupiter			Saturn			Mars		
	GHA	GHA	dec	GHA	dec		GHA	dec		GHA	dec		GHA	dec		GHA	dec	
0	280°00.9'	178°59.9'	N 23°03.1'	210°41.6'	N 20°43.9'	272°33.3'	N 1°48.6'	312°38.1'	S 14°26.1'	253°37.5'	N 8°57.8'							
1	295°03.3'	193°59.7'	N 23°02.9'	225°41.0'	N 20°44.4'	287°35.5'	N 1°48.6'	327°40.6'	S 14°26.2'	268°38.3'	N 8°58.5'							
2	310°05.8'	208°59.6'	N 23°02.7'	240°40.3'	N 20°44.9'	302°37.8'	N 1°48.7'	342°43.2'	S 14°26.2'	283°39.1'	N 8°59.1'							
3	325°08.3'	223°59.5'	N 23°02.5'	255°39.6'	N 20°45.4'	317°40.1'	N 1°48.8'	357°45.8'	S 14°26.3'	298°39.9'	N 8°59.7'							
4	340°10.7'	238°59.4'	N 23°02.4'	270°38.9'	N 20°45.9'	332°42.3'	N 1°48.8'	12°48.3'	S 14°26.3'	313°40.7'	N 9°00.4'							
5	355°13.2'	253°59.3'	N 23°02.2'	285°38.2'	N 20°46.4'	347°44.6'	N 1°48.9'	27°50.9'	S 14°26.4'	328°41.5'	N 9°01.0'							
6	10°15.7'	268°59.1'	N 23°02.0'	300°37.5'	N 20°46.9'	2°46.9'	N 1°49.0'	42°53.5'	S 14°26.4'	343°42.3'	N 9°01.6'							
7	25°18.1'	283°59.0'	N 23°01.8'	315°36.8'	N 20°47.4'	17°49.2'	N 1°49.1'	57°56.0'	S 14°26.4'	358°43.1'	N 9°02.3'							
8	40°20.6'	298°58.9'	N 23°01.6'	330°36.1'	N 20°47.9'	32°51.4'	N 1°49.1'	72°58.6'	S 14°26.5'	13°43.9'	N 9°02.9'							
9	55°23.1'	313°58.8'	N 23°01.4'	345°35.4'	N 20°48.4'	47°53.7'	N 1°49.2'	88°01.1'	S 14°26.5'	28°44.7'	N 9°03.5'							
10	70°25.5'	328°58.7'	N 23°01.2'	0°34.8'	N 20°48.9'	62°56.0'	N 1°49.3'	103°03.7'	S 14°26.6'	43°45.5'	N 9°04.1'							
11	85°28.0'	343°58.6'	N 23°01.1'	15°34.1'	N 20°49.4'	77°58.2'	N 1°49.3'	118°06.3'	S 14°26.6'	58°46.3'	N 9°04.8'							
12	100°30.5'	358°58.4'	N 23°00.9'	30°33.4'	N 20°49.9'	93°00.5'	N 1°49.4'	133°08.8'	S 14°26.7'	73°47.1'	N 9°05.4'							
13	115°32.9'	13°58.3'	N 23°00.7'	45°32.7'	N 20°50.4'	108°02.8'	N 1°49.5'	148°11.4'	S 14°26.7'	88°47.9'	N 9°06.0'							
14	130°35.4'	28°58.2'	N 23°00.5'	60°32.0'	N 20°50.9'	123°05.0'	N 1°49.5'	163°14.0'	S 14°26.7'	103°48.7'	N 9°06.7'							
15	145°37.8'	43°58.1'	N 23°00.3'	75°31.3'	N 20°51.4'	138°07.3'	N 1°49.6'	178°16.5'	S 14°26.8'	118°49.5'	N 9°07.3'							
16	160°40.3'	58°58.0'	N 23°00.1'	90°30.6'	N 20°51.9'	153°09.6'	N 1°49.7'	193°19.1'	S 14°26.8'	133°50.3'	N 9°07.9'							
17	175°42.8'	73°57.8'	N 22°59.9'	105°29.9'	N 20°52.4'	168°11.9'	N 1°49.8'	208°21.7'	S 14°26.9'	148°51.1'	N 9°08.5'							
18	190°45.2'	88°57.7'	N 22°59.7'	120°29.2'	N 20°52.9'	183°14.1'	N 1°49.8'	223°24.2'	S 14°26.9'	163°51.9'	N 9°09.2'							
19	205°47.7'	103°57.6'	N 22°59.5'	135°28.5'	N 20°53.4'	198°16.4'	N 1°49.9'	238°26.8'	S 14°26.9'	178°52.7'	N 9°09.8'							
20	220°50.2'	118°57.5'	N 22°59.3'	150°27.8'	N 20°53.9'	213°18.7'	N 1°50.0'	253°29.4'	S 14°27.0'	193°53.5'	N 9°10.4'							
21	235°52.6'	133°57.4'	N 22°59.1'	165°27.1'	N 20°54.4'	228°20.9'	N 1°50.0'	268°31.9'	S 14°27.0'	208°54.3'	N 9°11.1'							
22	250°55.1'	148°57.3'	N 22°58.9'	180°26.4'	N 20°54.9'	243°23.2'	N 1°50.1'	283°34.5'	S 14°27.1'	223°55.1'	N 9°11.7'							
23	265°57.6'	163°57.1'	N 22°58.7'	195°25.7'	N 20°55.4'	258°25.5'	N 1°50.2'	298°37.1'	S 14°27.1'	238°55.9'	N 9°12.3'							
		SD 15.7' d -0.2'		v -0.7' d 0.5'		v 2.3' d 0.1'		v 2.6' d -0.0'		v 0.8' d 0.6'								
Mer. pass.		12 h 4 m 7 s		9 h 58 m		5 h 49 m		3 h 9 m		7 h 5 m								

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-AcruX	-Spica	-Arcturus	-Regulus	+Pollux	+Procyon	+Sun	+Sirius
0	144°26.2'	N 22°08.1'	12.5'	-8.1'	54.2'	94°21.4'	72°48.4'	72°46.1'	19°02.9'	18°04.7'	26°04.4'		
1	158°57.6'	N 21°60.0'	12.5'	-8.2'	54.2'	94°03.7'	72°18.7'	72°20.2'	18°34.0'	18°34.3'	26°22.4'		
2	173°29.1'	N 21°51.7'	12.6'	-8.3'	54.2'	93°46.0'	71°48.9'	71°54.3'	18°05.1'	19°04.0'	26°40.7'		
3	188°00.7'	N 21°43.4'	12.6'	-8.4'	54.3'	93°28.2'	71°19.1'	71°28.4'	17°36.3'	19°33.7'	26°59.4'		
4	202°32.3'	N 21°35.0'	12.7'	-8.5'	54.3'	93°10.4'	70°49.3'	71°02.5'	17°07.5'	20°03.4'	27°18.4'		
5	217°04.0'	N 21°26.4'	12.7'	-8.6'	54.3'	92°52.7'	70°19.5'	70°36.7'	16°38.7'	20°33.1'	27°37.7'		
6	231°35.7'	N 21°17.8'	12.8'	-8.7'	54.3'	92°34.9'	69°49.7'	70°10.8'	16°10.0'	21°02.9'	27°57.3'		
7	246°07.4'	N 21°09.1'	12.8'	-8.8'	54.3'	92°17.0'	69°19.9'	69°45.0'	15°41.4'	21°32.6'	28°17.2'		52°54.4'
8	260°39.2'	N 21°00.3'	12.9'	-8.9'	54.3'	91°59.2'	68°50.0'	69°19.2'	15°12.8'	22°02.4'	28°37.3'		53°09.5'
9	275°11.1'	N 20°51.3'	12.9'	-9.0'	54.3'	91°41.4'	68°20.2'	68°53.4'	14°44.4'	22°32.2'	28°57.7'		53°24.8'
10	289°43.0'	N 20°42.3'	12.9'	-9.1'	54.3'	91°23.5'	67°50.3'	68°27.6'	14°16.0'	23°02.0'	29°18.4'		53°40.2'
11	304°14.9'	N 20°33.2'	13.0'	-9.2'	54.4'	91°05.6'	67°20.4'	68°01.8'	13°47.7'	23°31.9'	29°39.3'		53°55.7'
12	318°46.9'	N 20°24.0'	13.0'	-9.3'	54.4'	90°47.8'	66°50.6'	67°36.1'	13°19.5'	24°01.7'	30°00.5'		
13	333°19.0'	N 20°14.8'	13.1'	-9.4'	54.4'	90°29.9'	66°20.7'	67°10.3'	12°51.4'	24°31.6'	30°21.9'		
14	347°51.1'	N 20°05.4'	13.1'	-9.5'	54.4'	90°12.0'	65°50.8'	66°44.6'	12°23.5'	25°01.5'	30°43.5'		
15	2°23.2'	N 19°55.9'	13.2'	-9.6'	54.4'	89°54.1'	65°20.8'	66°18.9'	11°55.7'	25°31.4'	31°05.3'		
16	16°55.4'	N 19°46.3'	13.2'	-9.6'	54.4'	89°36.2'	64°50.9'	65°53.3'	11°28.1'	26°01.3'	31°27.4'		
17	31°27.6'	N 19°36.7'	13.3'	-9.7'	54.4'	89°18.3'	64°21.0'	65°27.6'	11°00.7'	26°31.3'	31°49.6'		
18	45°59.9'	N 19°27.0'	13.3'	-9.8'	54.4'	89°00.3'	63°51.0'	65°02.0'	10°33.5'	27°01.2'	32°12.1'	40°04.1'	
19	60°32.3'	N 19°17.1'	13.4'	-9.9'	54.5'	88°42.4'	63°21.1'	64°36.4'	10°06.6'	27°31.2'	32°34.7'	40°31.7'	
20	75°04.6'	N 19°07.2'	13.4'	-10.0'	54.5'	88°24.5'	62°51.1'	64°10.8'	9°40.0'	28°01.2'	32°57.6'	40°59.2'	
21	89°37.1'	N 18°57.2'	13.5'	-10.1'	54.5'	88°06.5'	62°21.1'	63°45.2'	9°13.7'	28°31.2'	33°20.6'	41°26.8'	
22	104°09.5'	N 18°47.1'	13.5'	-10.2'	54.5'	87°48.6'	61°51.1'	63°19.7'	8°47.8'	29°01.2'	33°43.8'	41°54.4'	
23	118°42.0'	N 18°37.0'	13.6'	-10.3'	54.5'	87°30.6'	61°21.1'	62°54.2'	8°22.3'	29°31.3'	34°07.1'	42°22.0'	
Mer. pass.		14 h 50 m SD 14.8'		phase 8%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.7'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.7'	N 7°24.7'
Deneb	+1.2	49°26.8'	N 45°21.5'	Acrux	+0.8	173°02.4'	S 63°13.6'	Capella	+0.1	280°25.4'	N 46°01.1'
Altair	+0.8	62°01.7'	N 8°55.6'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.2'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.3'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°17.6'	N 89°21.2'
Rigil Kent	-0.0	139°42.8'	S 60°55.8'	Adhara	+1.5	255°07.9'	S 29°00.1'	Achernar	+0.5	335°21.9'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.8'				
Hadar	+0.6	148°38.7'	S 60°29.1'	Canopus	-0.6	263°53.9'	S 52°42.4'				

h	Aries			Sun			Venus			Jupiter			Saturn			Mars		
	GHA	GHA	dec	GHA	dec		GHA	dec		GHA	dec		GHA	dec		GHA	dec	
0	281°00.0'	178°57.0'	N 22°58.5'	210°25.0'	N 20°55.9'		273°27.8'	N 1°50.2'		313°39.6'	S 14°27.2'		253°56.6'	N 9°12.9'				
1	296°02.5'	193°56.9'	N 22°58.3'	225°24.4'	N 20°56.4'		288°30.0'	N 1°50.3'		328°42.2'	S 14°27.2'		268°57.4'	N 9°13.6'				
2	311°05.0'	208°56.8'	N 22°58.1'	240°23.7'	N 20°56.8'		303°32.3'	N 1°50.4'		343°44.8'	S 14°27.2'		283°58.2'	N 9°14.2'				
3	326°07.4'	223°56.7'	N 22°57.9'	255°23.0'	N 20°57.3'		318°34.6'	N 1°50.4'		358°47.3'	S 14°27.3'		298°59.0'	N 9°14.8'				
4	341°09.9'	238°56.6'	N 22°57.7'	270°22.3'	N 20°57.8'		333°36.9'	N 1°50.5'		13°49.9'	S 14°27.3'		313°59.8'	N 9°15.4'				
5	356°12.3'	253°56.4'	N 22°57.5'	285°21.6'	N 20°58.3'		348°39.1'	N 1°50.6'		28°52.5'	S 14°27.4'		329°00.6'	N 9°16.1'				
6	11°14.8'	268°56.3'	N 22°57.3'	300°20.9'	N 20°58.8'		3°41.4'	N 1°50.6'		43°55.0'	S 14°27.4'		344°01.4'	N 9°16.7'				
7	26°17.3'	283°56.2'	N 22°57.1'	315°20.2'	N 20°59.3'		18°43.7'	N 1°50.7'		58°57.6'	S 14°27.5'		359°02.2'	N 9°17.3'				
8	41°19.7'	298°56.1'	N 22°56.9'	330°19.5'	N 20°59.8'		33°46.0'	N 1°50.8'		74°00.2'	S 14°27.5'		14°03.0'	N 9°18.0'				
9	56°22.2'	313°56.0'	N 22°56.7'	345°18.8'	N 21°00.2'		48°48.2'	N 1°50.9'		89°02.7'	S 14°27.5'		29°03.8'	N 9°18.6'				
10	71°24.7'	328°55.9'	N 22°56.5'	0°18.1'	N 21°00.7'		63°50.5'	N 1°50.9'		104°05.3'	S 14°27.6'		44°04.6'	N 9°19.2'				
11	86°27.1'	343°55.8'	N 22°56.3'	15°17.4'	N 21°01.2'		78°52.8'	N 1°51.0'		119°07.9'	S 14°27.6'		59°05.4'	N 9°19.8'				
12	101°29.6'	358°55.6'	N 22°56.1'	30°16.7'	N 21°01.7'		93°55.1'	N 1°51.1'		134°10.4'	S 14°27.7'		74°06.2'	N 9°20.5'				
13	116°32.1'	13°55.5'	N 22°55.9'	45°16.0'	N 21°02.1'		108°57.4'	N 1°51.1'		149°13.0'	S 14°27.7'		89°07.0'	N 9°21.1'				
14	131°34.5'	28°55.4'	N 22°55.7'	60°15.3'	N 21°02.6'		123°59.6'	N 1°51.2'		164°15.6'	S 14°27.8'		104°07.8'	N 9°21.7'				
15	146°37.0'	43°55.3'	N 22°55.5'	75°14.6'	N 21°03.1'		139°01.9'	N 1°51.3'		179°18.1'	S 14°27.8'		119°08.6'	N 9°22.3'				
16	161°39.4'	58°55.2'	N 22°55.3'	90°13.9'	N 21°03.6'		154°04.2'	N 1°51.3'		194°20.7'	S 14°27.9'		134°09.4'	N 9°22.9'				
17	176°41.9'	73°55.1'	N 22°55.1'	105°13.2'	N 21°04.0'		169°06.5'	N 1°51.4'		209°23.3'	S 14°27.9'		149°10.2'	N 9°23.6'				
18	191°44.4'	88°55.0'	N 22°54.9'	120°12.4'	N 21°04.5'		184°08.7'	N 1°51.5'		224°25.8'	S 14°27.9'		164°11.0'	N 9°24.2'				
19	206°46.8'	103°54.8'	N 22°54.7'	135°11.7'	N 21°05.0'		199°11.0'	N 1°51.5'		239°28.4'	S 14°28.0'		179°11.8'	N 9°24.8'				
20	221°49.3'	118°54.7'	N 22°54.4'	150°11.0'	N 21°05.5'		214°13.3'	N 1°51.6'		254°31.0'	S 14°28.0'		194°12.6'	N 9°25.4'				
21	236°51.8'	133°54.6'	N 22°54.2'	165°10.3'	N 21°05.9'		229°15.6'	N 1°51.7'		269°33.6'	S 14°28.1'		209°13.4'	N 9°26.1'				
22	251°54.2'	148°54.5'	N 22°54.0'	180°09.6'	N 21°06.4'		244°17.9'	N 1°51.7'		284°36.1'	S 14°28.1'		224°14.2'	N 9°26.7'				
23	266°56.7'	163°54.4'	N 22°53.8'	195°08.9'	N 21°06.9'		259°20.1'	N 1°51.8'		299°38.7'	S 14°28.2'		239°15.0'	N 9°27.3'				
		SD 15.7' d -0.2'		v -0.7' d 0.5'			v 2.3' d 0.1'			v 2.6' d -0.0'			v 0.8' d 0.6'					
Mer. pass.		12 h 4 m 18 s		9 h 59 m			5 h 45 m			3 h 5 m			7 h 4 m					

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Antares	-Acrux	-Arcturus	-Spica	-Regulus	+Pollux	+Procyon	+Sun
0	133°14.6'	N 18°26.7'	13.6'	-10.3'	54.5'	106°43.2'	87°12.7'	62°28.7'	60°51.0'	7°57.4'	30°01.3'	34°30.7'	42°49.6'
1	147°47.2'	N 18°16.4'	13.7'	-10.4'	54.6'	106°13.1'	86°54.8'	62°03.2'	60°21.0'	7°33.1'	30°31.4'	34°54.4'	43°17.3'
2	162°19.9'	N 18°06.0'	13.7'	-10.5'	54.6'	105°42.9'	86°36.8'	61°37.8'	59°50.9'		31°01.5'	35°18.2'	43°45.0'
3	176°52.6'	N 17°55.5'	13.7'	-10.6'	54.6'	105°12.8'	86°18.9'	61°12.4'	59°20.8'		31°31.6'	35°42.2'	44°12.6'
4	191°25.3'	N 17°44.9'	13.8'	-10.7'	54.6'	104°42.6'	86°00.9'	60°47.0'	58°50.8'		32°01.7'	36°06.3'	44°40.3'
5	205°58.1'	N 17°34.2'	13.8'	-10.7'	54.6'	104°12.4'	85°43.0'	60°21.7'	58°20.7'		32°31.9'	36°30.6'	45°08.0'
6	220°30.9'	N 17°23.5'	13.9'	-10.8'	54.6'	103°42.2'	85°25.0'	59°56.3'	57°50.5'		33°02.0'	36°55.0'	45°35.8'
7	235°03.8'	N 17°12.7'	13.9'	-10.9'	54.7'	103°12.0'	85°07.1'	59°31.1'	57°20.4'		33°32.2'	37°19.6'	46°03.5'
8	249°36.7'	N 17°01.8'	14.0'	-11.0'	54.7'	102°41.8'	84°49.2'	59°05.8'	56°50.3'		34°02.4'	37°44.3'	46°31.3'
9	264°09.7'	N 16°50.8'	14.0'	-11.1'	54.7'	102°11.5'	84°31.3'	58°40.6'	56°20.1'		34°32.7'	38°09.1'	46°59.1'
10	278°42.7'	N 16°39.8'	14.0'	-11.1'	54.7'	101°41.3'	84°13.3'	58°15.4'	55°49.9'		35°02.9'	38°34.0'	47°26.9'
11	293°15.7'	N 16°28.6'	14.1'	-11.2'	54.7'	101°11.0'	83°55.4'	57°50.3'	55°19.7'		35°33.1'	38°59.1'	47°54.7'
12	307°48.8'	N 16°17.4'	14.1'	-11.3'	54.7'	100°40.7'	83°37.5'	57°25.2'	54°49.5'		36°03.4'	39°24.3'	48°22.6'
13	322°21.9'	N 16°06.2'	14.2'	-11.3'	54.8'	100°10.4'	83°19.6'	57°00.2'	54°19.3'		36°33.7'	39°49.6'	48°50.4'
14	336°55.0'	N 15°54.8'	14.2'	-11.4'	54.8'	99°40.0'	83°01.8'	56°35.1'	53°49.1'		37°04.0'	40°15.0'	49°18.3'
15	351°28.2'	N 15°43.4'	14.2'	-11.5'	54.8'	99°09.7'	82°43.9'	56°10.2'	53°18.8'		37°34.4'	40°40.5'	49°46.2'
16	6°01.5'	N 15°31.9'	14.3'	-11.6'	54.8'	98°39.3'	82°26.0'	55°45.2'	52°48.5'		38°04.7'	41°06.1'	50°14.1'
17	20°34.7'	N 15°20.3'	14.3'	-11.6'	54.8'	98°08.9'	82°08.2'	55°20.3'	52°18.2'		38°35.1'	41°31.9'	50°42.1'
18	35°08.0'	N 15°08.7'	14.3'	-11.7'	54.9'	97°38.5'	81°50.3'	54°55.5'	51°47.9'		39°05.5'	41°57.7'	51°10.0'
19	49°41.4'	N 14°57.0'	14.4'	-11.8'	54.9'	97°08.1'	81°32.5'	54°30.7'	51°17.6'		39°35.9'	42°23.6'	51°38.0'
20	64°14.7'	N 14°45.2'	14.4'	-11.8'	54.9'	96°37.6'	81°14.7'	54°06.0'	50°47.3'		40°06.3'	42°49.6'	52°06.0'
21	78°48.1'	N 14°33.4'	14.4'	-11.9'	54.9'	96°07.2'	80°56.9'	53°41.3'	50°16.9'		40°36.8'	43°15.8'	52°34.0'
22	93°21.6'	N 14°21.5'	14.5'	-12.0'	54.9'	95°36.7'	80°39.2'	53°16.7'	49°46.5'		41°07.3'	43°42.0'	53°02.1'
23	107°55.0'	N 14°09.5'	14.5'	-12.0'	55.0'	95°06.2'	80°21.4'	52°52.1'	49°16.1'		41°37.8'	44°08.3'	53°30.1'
Mer. pass.		15 h 35 m SD 14.9'		phase 13%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.6'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.7'	N 7°24.7'
Deneb	+1.2	49°26.8'	N 45°21.5'	Acrux	+0.8	173°02.4'	S 63°13.6'	Capella	+0.1	280°25.4'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.6'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.2'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.3'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°17.2'	N 89°21.2'
Rigil Kent	-0.0	139°42.8'	S 60°55.8'	Adhara	+1.5	255°07.9'	S 29°00.1'	Achernar	+0.5	335°21.9'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.8'				
Hadar	+0.6	148°38.7'	S 60°29.1'	Canopus	-0.6	263°53.9'	S 52°42.4'				

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	281°59.2'	178°54.3'	N 22°53.6'	210°08.2'	N 21°07.3'	274°22.4'	N 1°51.9'	314°41.3'	S 14°28.2'	254°15.8'	N 9°27.9'			
1	297°01.6'	193°54.2'	N 22°53.4'	225°07.5'	N 21°07.8'	289°24.7'	N 1°51.9'	329°43.8'	S 14°28.2'	269°16.6'	N 9°28.6'			
2	312°04.1'	208°54.0'	N 22°53.2'	240°06.8'	N 21°08.3'	304°27.0'	N 1°52.0'	344°46.4'	S 14°28.3'	284°17.4'	N 9°29.2'			
3	327°06.6'	223°53.9'	N 22°52.9'	255°06.1'	N 21°08.7'	319°29.3'	N 1°52.1'	359°49.0'	S 14°28.3'	299°18.2'	N 9°29.8'			
4	342°09.0'	238°53.8'	N 22°52.7'	270°05.4'	N 21°09.2'	334°31.5'	N 1°52.1'	14°51.5'	S 14°28.4'	314°19.0'	N 9°30.4'			
5	357°11.5'	253°53.7'	N 22°52.5'	285°04.7'	N 21°09.6'	349°33.8'	N 1°52.2'	29°54.1'	S 14°28.4'	329°19.8'	N 9°31.0'			
6	12°13.9'	268°53.6'	N 22°52.3'	300°04.0'	N 21°10.1'	4°36.1'	N 1°52.2'	44°56.7'	S 14°28.5'	344°20.6'	N 9°31.7'			
7	27°16.4'	283°53.5'	N 22°52.1'	315°03.3'	N 21°10.6'	19°38.4'	N 1°52.3'	59°59.3'	S 14°28.5'	359°21.4'	N 9°32.3'			
8	42°18.9'	298°53.4'	N 22°51.9'	330°02.6'	N 21°11.0'	34°40.7'	N 1°52.4'	75°01.8'	S 14°28.6'	14°22.2'	N 9°32.9'			
9	57°21.3'	313°53.3'	N 22°51.6'	345°01.9'	N 21°11.5'	49°43.0'	N 1°52.4'	90°04.4'	S 14°28.6'	29°23.0'	N 9°33.5'			
10	72°23.8'	328°53.1'	N 22°51.4'	0°01.1'	N 21°11.9'	64°45.2'	N 1°52.5'	105°07.0'	S 14°28.6'	44°23.8'	N 9°34.1'			
11	87°26.3'	343°53.0'	N 22°51.2'	15°00.4'	N 21°12.4'	79°47.5'	N 1°52.6'	120°09.5'	S 14°28.7'	59°24.6'	N 9°34.8'			
12	102°28.7'	358°52.9'	N 22°51.0'	29°59.7'	N 21°12.8'	94°49.8'	N 1°52.6'	135°12.1'	S 14°28.7'	74°25.4'	N 9°35.4'			
13	117°31.2'	13°52.8'	N 22°50.7'	44°59.0'	N 21°13.3'	109°52.1'	N 1°52.7'	150°14.7'	S 14°28.8'	89°26.2'	N 9°36.0'			
14	132°33.7'	28°52.7'	N 22°50.5'	59°58.3'	N 21°13.7'	124°54.4'	N 1°52.8'	165°17.3'	S 14°28.8'	104°27.0'	N 9°36.6'			
15	147°36.1'	43°52.6'	N 22°50.3'	74°57.6'	N 21°14.2'	139°56.7'	N 1°52.8'	180°19.8'	S 14°28.9'	119°27.8'	N 9°37.2'			
16	162°38.6'	58°52.5'	N 22°50.1'	89°56.9'	N 21°14.6'	154°58.9'	N 1°52.9'	195°22.4'	S 14°28.9'	134°28.6'	N 9°37.9'			
17	177°41.1'	73°52.4'	N 22°49.8'	104°56.2'	N 21°15.1'	170°01.2'	N 1°53.0'	210°25.0'	S 14°29.0'	149°29.4'	N 9°38.5'			
18	192°43.5'	88°52.3'	N 22°49.6'	119°55.4'	N 21°15.5'	185°03.5'	N 1°53.0'	225°27.5'	S 14°29.0'	164°30.2'	N 9°39.1'			
19	207°46.0'	103°52.1'	N 22°49.4'	134°54.7'	N 21°16.0'	200°05.8'	N 1°53.1'	240°30.1'	S 14°29.0'	179°31.0'	N 9°39.7'			
20	222°48.4'	118°52.0'	N 22°49.2'	149°54.0'	N 21°16.4'	215°08.1'	N 1°53.1'	255°32.7'	S 14°29.1'	194°31.8'	N 9°40.3'			
21	237°50.9'	133°51.9'	N 22°48.9'	164°53.3'	N 21°16.9'	230°10.4'	N 1°53.2'	270°35.3'	S 14°29.1'	209°32.6'	N 9°41.0'			
22	252°53.4'	148°51.8'	N 22°48.7'	179°52.6'	N 21°17.3'	245°12.7'	N 1°53.3'	285°37.8'	S 14°29.2'	224°33.4'	N 9°41.6'			
23	267°55.8'	163°51.7'	N 22°48.5'	194°51.9'	N 21°17.8'	260°14.9'	N 1°53.3'	300°40.4'	S 14°29.2'	239°34.2'	N 9°42.2'			
		SD 15.7' d -0.2'		v -0.7' d 0.5'		v 2.3' d 0.1'		v 2.6' d -0.0'		v 0.8' d 0.6'				
Mer. pass.		12 h 4 m 29 s		10 h 0 m		5 h 42 m		3 h 1 m		7 h 3 m				

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Hadar	-Acrux	-Arcturus	-Spica	+Regulus	+Pollux	+Procyon	+Sun
0	122°28.5'	N 13°57.4'	14.5'	-12.1'	55.0'	85°05.8'	80°03.7'	52°27.6'	48°45.7'		42°08.3'	44°34.7'	53°58.2'
1	137°02.1'	N 13°45.3'	14.6'	-12.2'	55.0'	84°43.7'	79°45.9'	52°03.1'	48°15.3'	7°39.3'	42°38.8'	45°01.2'	54°26.3'
2	151°35.6'	N 13°33.2'	14.6'	-12.2'	55.0'	84°21.7'	79°28.2'	51°38.7'	47°44.9'	8°04.2'	43°09.4'	45°27.7'	54°54.4'
3	166°09.2'	N 13°20.9'	14.6'	-12.3'	55.0'	83°59.6'	79°10.6'	51°14.4'	47°14.4'	8°29.6'	43°40.0'	45°54.4'	55°22.6'
4	180°42.9'	N 13°08.6'	14.7'	-12.4'	55.1'	83°37.6'	78°52.9'	50°50.1'	46°43.9'	8°55.7'	44°10.6'	46°21.1'	55°50.8'
5	195°16.5'	N 12°56.2'	14.7'	-12.4'	55.1'	83°15.5'	78°35.3'	50°25.9'	46°13.4'	9°22.2'	44°41.2'	46°47.9'	56°19.0'
6	209°50.2'	N 12°43.8'	14.7'	-12.5'	55.1'	82°53.4'	78°17.7'	50°01.7'	45°42.9'	9°49.1'	45°11.9'	47°14.8'	56°47.2'
7	224°23.9'	N 12°31.3'	14.7'	-12.5'	55.1'	82°31.4'	78°00.1'	49°37.7'	45°12.3'	10°16.4'	45°42.5'	47°41.8'	57°15.4'
8	238°57.6'	N 12°18.8'	14.8'	-12.6'	55.1'	82°09.3'	77°42.6'	49°13.7'	44°41.8'	10°44.1'	46°13.2'	48°08.8'	57°43.7'
9	253°31.4'	N 12°06.2'	14.8'	-12.7'	55.2'	81°47.3'	77°25.0'	48°49.7'	44°11.2'	11°12.0'	46°43.9'	48°36.0'	58°12.0'
10	268°05.2'	N 11°53.5'	14.8'	-12.7'	55.2'	81°25.2'	77°07.5'	48°25.9'	43°40.6'	11°40.1'	47°14.7'	49°03.2'	58°40.3'
11	282°39.0'	N 11°40.8'	14.8'	-12.8'	55.2'	81°03.2'	76°50.1'	48°02.1'	43°10.0'	12°08.6'	47°45.5'	49°30.4'	59°08.6'
12	297°12.8'	N 11°28.0'	14.8'	-12.8'	55.2'	80°41.1'	76°32.6'	47°38.4'	42°39.3'	12°37.2'	48°16.2'	49°57.8'	59°37.0'
13	311°46.6'	N 11°15.2'	14.9'	-12.9'	55.3'	80°19.1'	76°15.2'	47°14.9'	42°08.7'	13°06.0'	48°47.1'	50°25.2'	60°05.3'
14	326°20.5'	N 11°02.3'	14.9'	-12.9'	55.3'	79°57.1'	75°57.8'	46°51.4'	41°38.0'	13°34.9'	49°17.9'	50°52.7'	60°33.7'
15	340°54.4'	N 10°49.4'	14.9'	-13.0'	55.3'	79°35.0'	75°40.5'	46°27.9'	41°07.3'	14°04.0'	49°48.8'	51°20.2'	61°02.2'
16	355°28.3'	N 10°36.4'	14.9'	-13.1'	55.3'	79°13.0'	75°23.2'	46°04.6'	40°36.6'	14°33.3'	50°19.7'	51°47.8'	61°30.6'
17	10°02.2'	N 10°23.3'	14.9'	-13.1'	55.4'	78°51.0'	75°05.9'	45°41.4'	40°05.9'	15°02.7'	50°50.6'	52°15.5'	61°59.1'
18	24°36.1'	N 10°10.2'	15.0'	-13.2'	55.4'	78°29.0'	74°48.7'	45°18.3'	39°35.1'	15°32.2'	51°21.5'	52°43.3'	62°27.6'
19	39°10.1'	N 9°57.0'	15.0'	-13.2'	55.4'	78°07.0'	74°31.5'	44°55.3'	39°04.3'	16°01.9'	51°52.5'	53°11.1'	62°56.1'
20	53°44.1'	N 9°43.8'	15.0'	-13.3'	55.4'	77°45.0'	74°14.4'	44°32.4'	38°33.5'	16°31.6'	52°23.5'	53°38.9'	63°24.7'
21	68°18.1'	N 9°30.6'	15.0'	-13.3'	55.5'	77°23.1'	73°57.2'	44°09.6'	38°02.7'	17°01.4'	52°54.5'	54°06.9'	63°53.3'
22	82°52.1'	N 9°17.3'	15.0'	-13.4'	55.5'	77°01.1'	73°40.2'	43°46.9'	37°31.9'	17°31.4'	53°25.5'	54°34.9'	64°21.9'
23	97°26.1'	N 9°03.9'	15.0'	-13.4'	55.5'	76°39.2'	73°23.1'	43°24.3'	37°01.0'	18°01.4'	53°56.6'	55°02.9'	64°50.5'
Mer. pass.		16 h 19 m SD 15.0'		phase 21%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.6'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.7'	N 7°24.7'
Deneb	+1.2	49°26.8'	N 45°21.5'	Acrux	+0.8	173°02.4'	S 63°13.6'	Capella	+0.1	280°25.4'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.6'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.2'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.3'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°16.8'	N 89°21.2'
Rigil Kent	-0.0	139°42.8'	S 60°55.8'	Adhara	+1.5	255°07.9'	S 29°00.1'	Achernar	+0.5	335°21.9'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.8'				
Hadar	+0.6	148°38.7'	S 60°29.1'	Canopus	-0.6	263°53.9'	S 52°42.4'				

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec		GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	282°58.3'	178°51.6'	N 22°48.2'	209°51.2'	N 21°18.2'	275°17.2'	N 1°53.4'	315°43.0'	S 14°29.3'	254°35.0'	N 9°42.8'			
1	298°00.8'	193°51.5'	N 22°48.0'	224°50.4'	N 21°18.7'	290°19.5'	N 1°53.5'	330°45.6'	S 14°29.3'	269°35.8'	N 9°43.4'			
2	313°03.2'	208°51.4'	N 22°47.8'	239°49.7'	N 21°19.1'	305°21.8'	N 1°53.5'	345°48.1'	S 14°29.4'	284°36.6'	N 9°44.0'			
3	328°05.7'	223°51.3'	N 22°47.5'	254°49.0'	N 21°19.5'	320°24.1'	N 1°53.6'	0°50.7'	S 14°29.4'	299°37.4'	N 9°44.7'			
4	343°08.2'	238°51.2'	N 22°47.3'	269°48.3'	N 21°20.0'	335°26.4'	N 1°53.7'	15°53.3'	S 14°29.4'	314°38.2'	N 9°45.3'			
5	358°10.6'	253°51.0'	N 22°47.1'	284°47.6'	N 21°20.4'	350°28.7'	N 1°53.7'	30°55.8'	S 14°29.5'	329°39.0'	N 9°45.9'			
6	13°13.1'	268°50.9'	N 22°46.8'	299°46.9'	N 21°20.9'	5°31.0'	N 1°53.8'	45°58.4'	S 14°29.5'	344°39.8'	N 9°46.5'			
7	28°15.5'	283°50.8'	N 22°46.6'	314°46.1'	N 21°21.3'	20°33.2'	N 1°53.8'	61°01.0'	S 14°29.6'	359°40.6'	N 9°47.1'			
8	43°18.0'	298°50.7'	N 22°46.4'	329°45.4'	N 21°21.7'	35°35.5'	N 1°53.9'	76°03.6'	S 14°29.6'	14°41.4'	N 9°47.7'			
9	58°20.5'	313°50.6'	N 22°46.1'	344°44.7'	N 21°22.2'	50°37.8'	N 1°54.0'	91°06.1'	S 14°29.7'	29°42.2'	N 9°48.4'			
10	73°22.9'	328°50.5'	N 22°45.9'	359°44.0'	N 21°22.6'	65°40.1'	N 1°54.0'	106°08.7'	S 14°29.7'	44°43.0'	N 9°49.0'			
11	88°25.4'	343°50.4'	N 22°45.7'	14°43.3'	N 21°23.0'	80°42.4'	N 1°54.1'	121°11.3'	S 14°29.8'	59°43.8'	N 9°49.6'			
12	103°27.9'	358°50.3'	N 22°45.4'	29°42.5'	N 21°23.5'	95°44.7'	N 1°54.1'	136°13.9'	S 14°29.8'	74°44.6'	N 9°50.2'			
13	118°30.3'	13°50.2'	N 22°45.2'	44°41.8'	N 21°23.9'	110°47.0'	N 1°54.2'	151°16.4'	S 14°29.9'	89°45.4'	N 9°50.8'			
14	133°32.8'	28°50.1'	N 22°44.9'	59°41.1'	N 21°24.3'	125°49.3'	N 1°54.3'	166°19.0'	S 14°29.9'	104°46.2'	N 9°51.4'			
15	148°35.3'	43°50.0'	N 22°44.7'	74°40.4'	N 21°24.7'	140°51.6'	N 1°54.3'	181°21.6'	S 14°29.9'	119°47.0'	N 9°52.0'			
16	163°37.7'	58°49.9'	N 22°44.5'	89°39.7'	N 21°25.2'	155°53.9'	N 1°54.4'	196°24.2'	S 14°30.0'	134°47.8'	N 9°52.7'			
17	178°40.2'	73°49.8'	N 22°44.2'	104°38.9'	N 21°25.6'	170°56.2'	N 1°54.5'	211°26.7'	S 14°30.0'	149°48.6'	N 9°53.3'			
18	193°42.7'	88°49.6'	N 22°44.0'	119°38.2'	N 21°26.0'	185°58.4'	N 1°54.5'	226°29.3'	S 14°30.1'	164°49.4'	N 9°53.9'			
19	208°45.1'	103°49.5'	N 22°43.7'	134°37.5'	N 21°26.4'	201°00.7'	N 1°54.6'	241°31.9'	S 14°30.1'	179°50.2'	N 9°54.5'			
20	223°47.6'	118°49.4'	N 22°43.5'	149°36.8'	N 21°26.9'	216°03.0'	N 1°54.6'	256°34.5'	S 14°30.2'	194°51.0'	N 9°55.1'			
21	238°50.0'	133°49.3'	N 22°43.2'	164°36.1'	N 21°27.3'	231°05.3'	N 1°54.7'	271°37.0'	S 14°30.2'	209°51.8'	N 9°55.7'			
22	253°52.5'	148°49.2'	N 22°43.0'	179°35.3'	N 21°27.7'	246°07.6'	N 1°54.8'	286°39.6'	S 14°30.3'	224°52.6'	N 9°56.3'			
23	268°55.0'	163°49.1'	N 22°42.7'	194°34.6'	N 21°28.1'	261°09.9'	N 1°54.8'	301°42.2'	S 14°30.3'	239°53.4'	N 9°57.0'			
		SD 15.7' d -0.2'		v -0.7' d 0.4'		v 2.3' d 0.1'		v 2.6' d -0.0'		v 0.8' d 0.6'				
Mer. pass.		12 h 4 m 40 s		10 h 1 m		5 h 38 m		2 h 57 m		7 h 1 m				

h	Moon					Lunar distance									
	GHA	dec	v	d	HP	-Hadar	-Acrux	-Arcturus	-Spica	+Regulus	+Pollux	+Procyon	+Sun		
0	112°00.1'	N 8°50.5'	15.0'	-13.5'	55.5'	76°17.2'	73°06.2'	43°01.9'	36°30.1'	18°31.5'	54°27.7'	55°31.1'	65°19.2'		
1	126°34.1'	N 8°37.0'	15.0'	-13.5'	55.6'	75°55.3'	72°49.2'	42°39.6'	35°59.2'	19°01.7'	54°58.8'	55°59.3'	65°47.9'		
2	141°08.1'	N 8°23.5'	15.0'	-13.5'	55.6'	75°33.4'	72°32.3'	42°17.4'	35°28.3'	19°31.9'	55°30.0'	56°27.5'	66°16.6'		
3	155°42.2'	N 8°10.0'	15.1'	-13.6'	55.6'	75°11.6'	72°15.5'	41°55.4'	34°57.3'	20°02.3'	56°01.2'	56°55.8'	66°45.4'		
4	170°16.2'	N 7°56.4'	15.1'	-13.6'	55.6'	74°49.7'	71°58.7'	41°33.5'	34°26.4'	20°32.7'	56°32.4'	57°24.2'	67°14.1'		
5	184°50.3'	N 7°42.8'	15.1'	-13.7'	55.7'	74°27.9'	71°41.9'	41°11.7'	33°55.4'	21°03.1'	57°03.6'	57°52.6'	67°42.9'		
6	199°24.4'	N 7°29.1'	15.1'	-13.7'	55.7'	74°06.0'	71°25.2'	40°50.1'	33°24.4'	21°33.7'	57°34.9'	58°21.0'	68°11.8'		
7	213°58.4'	N 7°15.3'	15.1'	-13.8'	55.7'	73°44.3'	71°08.6'	40°28.6'	32°53.4'	22°04.3'	58°06.2'	58°49.6'	68°40.6'		
8	228°32.5'	N 7°01.6'	15.1'	-13.8'	55.7'	73°22.5'	70°52.0'	40°07.3'	32°22.3'	22°34.9'	58°37.5'	59°18.1'	69°09.5'		
9	243°06.6'	N 6°47.8'	15.1'	-13.8'	55.8'	73°00.7'	70°35.5'	39°46.2'	31°51.3'	23°05.6'	59°08.9'	59°46.8'	69°38.4'		
10	257°40.7'	N 6°33.9'	15.1'	-13.9'	55.8'	72°39.0'	70°19.0'	39°25.2'	31°20.2'	23°36.4'	59°40.3'	60°15.5'	70°07.4'		
11	272°14.7'	N 6°20.0'	15.1'	-13.9'	55.8'	72°17.3'	70°02.6'	39°04.5'	30°49.1'	24°07.2'	60°11.7'	60°44.2'	70°36.4'		
12	286°48.8'	N 6°06.1'	15.1'	-14.0'	55.9'	71°55.6'	69°46.3'	38°43.9'	30°18.0'	24°38.1'	60°43.1'	61°13.0'	71°05.4'		
13	301°22.9'	N 5°52.1'	15.1'	-14.0'	55.9'	71°34.0'	69°30.0'	38°23.4'	29°46.8'	25°09.1'	61°14.6'	61°41.9'	71°34.4'		
14	315°56.9'	N 5°38.1'	15.1'	-14.0'	55.9'	71°12.4'	69°13.7'	38°03.2'	29°15.7'	25°40.0'	61°46.1'	62°10.8'	72°03.5'		
15	330°31.0'	N 5°24.1'	15.1'	-14.1'	55.9'	70°50.8'	68°57.6'	37°43.2'	28°44.5'	26°11.1'	62°17.6'	62°39.8'	72°32.6'		
16	345°05.0'	N 5°10.0'	15.0'	-14.1'	56.0'	70°29.3'	68°41.5'	37°23.4'	28°13.3'	26°42.2'	62°49.2'	63°08.8'	73°01.7'		
17	359°39.1'	N 4°55.9'	15.0'	-14.1'	56.0'	70°07.7'	68°25.5'	37°03.8'	27°42.1'	27°13.3'	63°20.8'	63°37.8'	73°30.9'		
18	14°13.1'	N 4°41.8'	15.0'	-14.2'	56.0'	69°46.3'	68°09.5'	36°44.4'	27°10.8'	27°44.5'	63°52.5'	64°06.9'	74°00.1'		
19	28°47.2'	N 4°27.6'	15.0'	-14.2'	56.1'	69°24.8'	67°53.6'	36°25.2'	26°39.6'	28°15.7'	64°24.1'	64°36.1'	74°29.3'		
20	43°21.2'	N 4°13.4'	15.0'	-14.2'	56.1'	69°03.4'	67°37.8'	36°06.3'	26°08.3'	28°47.0'	64°55.8'	65°05.3'	74°58.6'		
21	57°55.2'	N 3°59.1'	15.0'	-14.3'	56.1'	68°42.0'	67°22.1'	35°47.6'	25°37.1'	29°18.3'	65°27.5'	65°34.6'	75°27.9'		
22	72°29.2'	N 3°44.9'	15.0'	-14.3'	56.1'	68°20.7'	67°06.4'	35°29.2'	25°05.8'	29°49.7'	65°59.3'	66°03.9'	75°57.2'		
23	87°03.1'	N 3°30.6'	15.0'	-14.3'	56.2'	67°59.4'	66°50.8'	35°11.0'	24°34.5'	30°21.1'	66°31.1'	66°33.3'	76°26.6'		
Mer. pass.		17 h 1 m SD 15.1'		phase 29%											

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.6'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.7'	N 7°24.7'
Deneb	+1.2	49°26.8'	N 45°21.5'	Acrux	+0.8	173°02.4'	S 63°13.6'	Capella	+0.1	280°25.4'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.2'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.3'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°16.4'	N 89°21.2'
Rigil Kent	-0.0	139°42.8'	S 60°55.9'	Adhara	+1.5	255°07.9'	S 29°00.1'	Achernar	+0.5	335°21.9'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.8'				
Hadar	+0.6	148°38.7'	S 60°29.1'	Canopus	-0.6	263°53.9'	S 52°42.4'				

h	Aries			Sun			Venus			Jupiter			Saturn			Mars		
	GHA	GHA	dec	GHA	dec		GHA	dec		GHA	dec		GHA	dec		GHA	dec	
0	283°57.4'	178°49.0'	N 22°42.5'	209°33.9'	N 21°28.5'		276°12.2'	N 1°54.9'		316°44.8'	S 14°30.4'		254°54.2'	N 9°57.6'				
1	298°59.9'	193°48.9'	N 22°42.3'	224°33.2'	N 21°29.0'		291°14.5'	N 1°54.9'		331°47.4'	S 14°30.4'		269°55.0'	N 9°58.2'				
2	314°02.4'	208°48.8'	N 22°42.0'	239°32.4'	N 21°29.4'		306°16.8'	N 1°55.0'		346°49.9'	S 14°30.4'		284°55.8'	N 9°58.8'				
3	329°04.8'	223°48.7'	N 22°41.8'	254°31.7'	N 21°29.8'		321°19.1'	N 1°55.1'		1°52.5'	S 14°30.5'		299°56.6'	N 9°59.4'				
4	344°07.3'	238°48.6'	N 22°41.5'	269°31.0'	N 21°30.2'		336°21.4'	N 1°55.1'		16°55.1'	S 14°30.5'		314°57.4'	N 10°00.0'				
5	359°09.8'	253°48.5'	N 22°41.3'	284°30.3'	N 21°30.6'		351°23.7'	N 1°55.2'		31°57.7'	S 14°30.6'		329°58.2'	N 10°00.6'				
6	14°12.2'	268°48.4'	N 22°41.0'	299°29.5'	N 21°31.0'		6°26.0'	N 1°55.2'		47°00.2'	S 14°30.6'		344°59.0'	N 10°01.2'				
7	29°14.7'	283°48.3'	N 22°40.7'	314°28.8'	N 21°31.4'		21°28.3'	N 1°55.3'		62°02.8'	S 14°30.7'		359°59.9'	N 10°01.8'				
8	44°17.1'	298°48.2'	N 22°40.5'	329°28.1'	N 21°31.9'		36°30.6'	N 1°55.4'		77°05.4'	S 14°30.7'		15°00.7'	N 10°02.5'				
9	59°19.6'	313°48.1'	N 22°40.2'	344°27.3'	N 21°32.3'		51°32.9'	N 1°55.4'		92°08.0'	S 14°30.8'		30°01.5'	N 10°03.1'				
10	74°22.1'	328°48.0'	N 22°40.0'	359°26.6'	N 21°32.7'		66°35.2'	N 1°55.5'		107°10.5'	S 14°30.8'		45°02.3'	N 10°03.7'				
11	89°24.5'	343°47.9'	N 22°39.7'	14°25.9'	N 21°33.1'		81°37.5'	N 1°55.5'		122°13.1'	S 14°30.9'		60°03.1'	N 10°04.3'				
12	104°27.0'	358°47.8'	N 22°39.5'	29°25.2'	N 21°33.5'		96°39.8'	N 1°55.6'		137°15.7'	S 14°30.9'		75°03.9'	N 10°04.9'				
13	119°29.5'	13°47.6'	N 22°39.2'	44°24.4'	N 21°33.9'		111°42.0'	N 1°55.6'		152°18.3'	S 14°31.0'		90°04.7'	N 10°05.5'				
14	134°31.9'	28°47.5'	N 22°39.0'	59°23.7'	N 21°34.3'		126°44.3'	N 1°55.7'		167°20.9'	S 14°31.0'		105°05.5'	N 10°06.1'				
15	149°34.4'	43°47.4'	N 22°38.7'	74°23.0'	N 21°34.7'		141°46.6'	N 1°55.8'		182°23.4'	S 14°31.0'		120°06.3'	N 10°06.7'				
16	164°36.9'	58°47.3'	N 22°38.4'	89°22.2'	N 21°35.1'		156°48.9'	N 1°55.8'		197°26.0'	S 14°31.1'		135°07.1'	N 10°07.3'				
17	179°39.3'	73°47.2'	N 22°38.2'	104°21.5'	N 21°35.5'		171°51.2'	N 1°55.9'		212°28.6'	S 14°31.1'		150°07.9'	N 10°08.0'				
18	194°41.8'	88°47.1'	N 22°37.9'	119°20.8'	N 21°35.9'		186°53.5'	N 1°55.9'		227°31.2'	S 14°31.2'		165°08.7'	N 10°08.6'				
19	209°44.3'	103°47.0'	N 22°37.7'	134°20.0'	N 21°36.3'		201°55.8'	N 1°56.0'		242°33.7'	S 14°31.2'		180°09.5'	N 10°09.2'				
20	224°46.7'	118°46.9'	N 22°37.4'	149°19.3'	N 21°36.7'		216°58.1'	N 1°56.1'		257°36.3'	S 14°31.3'		195°10.3'	N 10°09.8'				
21	239°49.2'	133°46.8'	N 22°37.1'	164°18.6'	N 21°37.1'		232°00.4'	N 1°56.1'		272°38.9'	S 14°31.3'		210°11.1'	N 10°10.4'				
22	254°51.6'	148°46.7'	N 22°36.9'	179°17.8'	N 21°37.5'		247°02.7'	N 1°56.2'		287°41.5'	S 14°31.4'		225°11.9'	N 10°11.0'				
23	269°54.1'	163°46.6'	N 22°36.6'	194°17.1'	N 21°37.9'		262°05.0'	N 1°56.2'		302°44.1'	S 14°31.4'		240°12.7'	N 10°11.6'				
		SD 15.7' d -0.3'		v -0.7' d 0.4'			v 2.3' d 0.1'			v 2.6' d -0.0'			v 0.8' d 0.6'					
Mer. pass.		12 h 4 m 50 s		10 h 2 m			5 h 34 m			2 h 53 m			7 h 0 m					

h	Moon					Lunar distance											
	GHA	dec	v	d	HP	-Hadar	-Acrux	-Arcturus	-Spica	+Regulus	+Procyon	+Pollux	+Sun				
0	101°37.1'	N 3°16.2'	14.9'	-14.4'	56.2'	67°38.2'	66°35.3'	34°53.1'	24°03.2'	30°52.6'	67°02.7'	67°02.9'	76°56.0'				
1	116°11.1'	N 3°01.9'	14.9'	-14.4'	56.2'	67°17.0'	66°19.9'	34°35.5'	23°31.8'	31°24.1'	67°32.2'	67°34.8'	77°25.4'				
2	130°45.0'	N 2°47.5'	14.9'	-14.4'	56.3'	66°55.9'	66°04.6'	34°18.1'	23°00.5'	31°55.6'	68°01.7'	68°06.7'	77°54.9'				
3	145°18.9'	N 2°33.0'	14.9'	-14.4'	56.3'	66°34.8'	65°49.3'	34°01.1'	22°29.2'	32°27.2'	68°31.3'	68°38.6'	78°24.4'				
4	159°52.8'	N 2°18.6'	14.9'	-14.5'	56.3'	66°13.7'	65°34.1'	33°44.3'	21°57.8'	32°58.9'	69°00.9'	69°10.6'	78°53.9'				
5	174°26.7'	N 2°04.1'	14.8'	-14.5'	56.4'	65°52.7'		33°27.8'	21°26.5'	33°30.5'	69°30.5'	69°42.6'	79°23.5'				
6	189°00.5'	N 1°49.6'	14.8'	-14.5'	56.4'	65°31.8'		33°11.7'	20°55.1'	34°02.3'	70°00.2'	70°14.7'	79°53.1'				
7	203°34.3'	N 1°35.1'	14.8'	-14.5'	56.4'	65°10.9'		32°55.9'	20°23.8'	34°34.1'	70°30.0'	70°46.7'	80°22.7'				
8	218°08.1'	N 1°20.6'	14.8'	-14.6'	56.5'	64°50.1'		32°40.4'	19°52.4'	35°05.9'	70°59.8'	71°18.8'	80°52.4'				
9	232°41.9'	N 1°06.0'	14.7'	-14.6'	56.5'	64°29.3'			19°21.1'	35°37.7'	71°29.7'	71°51.0'	81°22.1'				
10	247°15.6'	N 0°51.4'	14.7'	-14.6'	56.5'	64°08.6'			18°49.8'	36°09.6'	71°59.6'	72°23.2'	81°51.8'				
11	261°49.4'	N 0°36.8'	14.7'	-14.6'	56.6'	63°47.9'			18°18.5'	36°41.6'	72°29.5'	72°55.4'	82°21.6'				
12	276°23.0'	N 0°22.2'	14.7'	-14.6'	56.6'	63°27.3'			17°47.2'	37°13.6'	72°59.5'	73°27.6'	82°51.4'				
13	290°56.7'	N 0°07.6'	14.6'	-14.7'	56.6'	63°06.8'			17°15.9'	37°45.6'	73°29.6'	73°59.9'	83°21.3'				
14	305°30.3'	S 0°07.1'	14.6'	-14.7'	56.7'	62°46.4'			16°44.6'	38°17.7'	73°59.7'	74°32.3'	83°51.2'				
15	320°03.9'	S 0°21.8'	14.6'	-14.7'	56.7'	62°26.0'			16°13.4'	38°49.8'	74°29.8'	75°04.6'	84°21.1'				
16	334°37.5'	S 0°36.5'	14.5'	-14.7'	56.7'	62°05.7'			15°42.3'	39°22.0'	74°60.0'	75°37.0'	84°51.1'				
17	349°11.0'	S 0°51.2'	14.5'	-14.7'	56.8'	61°45.5'			15°11.1'	39°54.2'	75°30.2'	76°09.5'	85°21.1'				
18	3°44.4'	S 1°05.9'	14.4'	-14.7'	56.8'	61°25.3'			14°40.1'	40°26.5'	76°00.5'	76°42.0'	85°51.1'				
19	18°17.9'	S 1°20.6'	14.4'	-14.7'	56.8'	61°05.2'			14°09.1'	40°58.8'	76°30.8'	77°14.5'	86°21.2'				
20	32°51.3'	S 1°35.4'	14.4'	-14.8'	56.9'	60°45.2'			13°38.2'	41°31.1'	77°01.2'	77°47.0'	86°51.3'				
21	47°24.6'	S 1°50.1'	14.3'	-14.8'	56.9'	60°25.3'			13°07.4'	42°03.5'	77°31.6'	78°19.6'	87°21.5'				
22	61°58.0'	S 2°04.9'	14.3'	-14.8'	56.9'	60°05.5'			12°36.7'	42°35.9'	78°02.0'	78°52.3'	87°51.7'				
23	76°31.2'	S 2°19.7'	14.2'	-14.8'	57.0'	59°45.8'			12°06.1'	43°08.4'	78°32.6'	79°25.0'	88°21.9'				
Mer. pass.		17 h 45 m SD 15.3'		phase 39%													

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.6'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.7'	N 7°24.7'
Deneb	+1.2	49°26.8'	N 45°21.5'	Acrux	+0.8	173°02.5'	S 63°13.6'	Capella	+0.1	280°25.4'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.2'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.3'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°16.0'	N 89°21.2'
Rigil Kent	-0.0	139°42.8'	S 60°55.9'	Adhara	+1.5	255°07.9'	S 29°00.1'	Achernar	+0.5	335°21.9'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.8'				
Hadar	+0.6	148°38.7'	S 60°29.1'	Canopus	-0.6	263°53.9'	S 52°42.4'				

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	284°56.6'	178°46.5'	N 22°36.4'	209°16.4'	N 21°38.3'	277°07.3'	N 1°56.3'	317°46.6'	S 14°31.5'	255°13.5'	N 10°12.2'			
1	299°59.0'	193°46.4'	N 22°36.1'	224°15.6'	N 21°38.7'	292°09.6'	N 1°56.3'	332°49.2'	S 14°31.5'	270°14.3'	N 10°12.8'			
2	315°01.5'	208°46.3'	N 22°35.8'	239°14.9'	N 21°39.1'	307°11.9'	N 1°56.4'	347°51.8'	S 14°31.6'	285°15.1'	N 10°13.4'			
3	330°04.0'	223°46.2'	N 22°35.6'	254°14.2'	N 21°39.5'	322°14.2'	N 1°56.5'	2°54.4'	S 14°31.6'	300°15.9'	N 10°14.0'			
4	345°06.4'	238°46.1'	N 22°35.3'	269°13.4'	N 21°39.9'	337°16.5'	N 1°56.5'	17°57.0'	S 14°31.7'	315°16.7'	N 10°14.6'			
5	0°08.9'	253°46.0'	N 22°35.0'	284°12.7'	N 21°40.3'	352°18.8'	N 1°56.6'	32°59.5'	S 14°31.7'	330°17.5'	N 10°15.2'			
6	15°11.4'	268°45.9'	N 22°34.8'	299°12.0'	N 21°40.6'	7°21.1'	N 1°56.6'	48°02.1'	S 14°31.7'	345°18.3'	N 10°15.9'			
7	30°13.8'	283°45.8'	N 22°34.5'	314°11.2'	N 21°41.0'	22°23.4'	N 1°56.7'	63°04.7'	S 14°31.8'	0°19.1'	N 10°16.5'			
8	45°16.3'	298°45.7'	N 22°34.2'	329°10.5'	N 21°41.4'	37°25.8'	N 1°56.7'	78°07.3'	S 14°31.8'	15°19.9'	N 10°17.1'			
9	60°18.8'	313°45.6'	N 22°34.0'	344°09.8'	N 21°41.8'	52°28.1'	N 1°56.8'	93°09.9'	S 14°31.9'	30°20.7'	N 10°17.7'			
10	75°21.2'	328°45.5'	N 22°33.7'	359°09.0'	N 21°42.2'	67°30.4'	N 1°56.8'	108°12.4'	S 14°31.9'	45°21.5'	N 10°18.3'			
11	90°23.7'	343°45.4'	N 22°33.4'	14°08.3'	N 21°42.6'	82°32.7'	N 1°56.9'	123°15.0'	S 14°32.0'	60°22.3'	N 10°18.9'			
12	105°26.1'	358°45.3'	N 22°33.1'	29°07.6'	N 21°43.0'	97°35.0'	N 1°57.0'	138°17.6'	S 14°32.0'	75°23.1'	N 10°19.5'			
13	120°28.6'	13°45.2'	N 22°32.9'	44°06.8'	N 21°43.3'	112°37.3'	N 1°57.0'	153°20.2'	S 14°32.1'	90°23.9'	N 10°20.1'			
14	135°31.1'	28°45.1'	N 22°32.6'	59°06.1'	N 21°43.7'	127°39.6'	N 1°57.1'	168°22.8'	S 14°32.1'	105°24.8'	N 10°20.7'			
15	150°33.5'	43°45.0'	N 22°32.3'	74°05.3'	N 21°44.1'	142°41.9'	N 1°57.1'	183°25.3'	S 14°32.2'	120°25.6'	N 10°21.3'			
16	165°36.0'	58°44.9'	N 22°32.0'	89°04.6'	N 21°44.5'	157°44.2'	N 1°57.2'	198°27.9'	S 14°32.2'	135°26.4'	N 10°21.9'			
17	180°38.5'	73°44.8'	N 22°31.8'	104°03.9'	N 21°44.9'	172°46.5'	N 1°57.2'	213°30.5'	S 14°32.3'	150°27.2'	N 10°22.5'			
18	195°40.9'	88°44.7'	N 22°31.5'	119°03.1'	N 21°45.2'	187°48.8'	N 1°57.3'	228°33.1'	S 14°32.3'	165°28.0'	N 10°23.1'			
19	210°43.4'	103°44.6'	N 22°31.2'	134°02.4'	N 21°45.6'	202°51.1'	N 1°57.3'	243°35.7'	S 14°32.4'	180°28.8'	N 10°23.7'			
20	225°45.9'	118°44.5'	N 22°30.9'	149°01.6'	N 21°46.0'	217°53.4'	N 1°57.4'	258°38.3'	S 14°32.4'	195°29.6'	N 10°24.3'			
21	240°48.3'	133°44.4'	N 22°30.7'	164°00.9'	N 21°46.4'	232°55.7'	N 1°57.5'	273°40.8'	S 14°32.5'	210°30.4'	N 10°24.9'			
22	255°50.8'	148°44.3'	N 22°30.4'	179°00.2'	N 21°46.7'	247°58.0'	N 1°57.5'	288°43.4'	S 14°32.5'	225°31.2'	N 10°25.5'			
23	270°53.2'	163°44.2'	N 22°30.1'	193°59.4'	N 21°47.1'	263°00.3'	N 1°57.6'	303°46.0'	S 14°32.6'	240°32.0'	N 10°26.1'			
		SD 15.7' d -0.3'		v -0.7' d 0.4'		v 2.3' d 0.1'		v 2.6' d -0.0'		v 0.8' d 0.6'				
Mer. pass.		12 h 4 m 59 s		10 h 3 m		5 h 31 m		2 h 48 m		6 h 59 m				

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Rigil Kent	-Hadar	-Antares	-Spica	+Regulus	+Procyon	+Pollux	+Sun
0	91°04.4'	S 2°34.4'	14.2'	-14.8'	57.0'	61°42.6'	59°26.2'	56°47.2'	11°35.7'	43°40.9'	79°03.1'	79°57.7'	88°52.2'
1	105°37.6'	S 2°49.2'	14.1'	-14.8'	57.0'	61°21.1'	59°06.6'	56°14.5'	11°05.4'	44°13.5'	79°33.7'	80°30.4'	89°22.5'
2	120°10.8'	S 3°04.0'	14.1'	-14.8'	57.1'	60°59.7'	58°47.2'	55°41.8'	10°35.4'	44°46.1'	80°04.3'	81°03.2'	89°52.8'
3	134°43.8'	S 3°18.8'	14.0'	-14.8'	57.1'	60°38.4'	58°27.8'	55°09.0'	10°05.6'	45°18.7'	80°35.0'	81°36.1'	90°23.2'
4	149°16.9'	S 3°33.6'	14.0'	-14.8'	57.1'	60°17.1'	58°08.6'	54°36.1'	9°36.1'	45°51.4'	81°05.8'	82°08.9'	90°53.7'
5	163°49.8'	S 3°48.4'	13.9'	-14.8'	57.2'	59°55.9'	57°49.4'	54°03.2'	9°07.0'	46°24.2'	81°36.5'	82°41.9'	91°24.1'
6	178°22.8'	S 4°03.2'	13.9'	-14.8'	57.2'	59°34.8'	57°30.4'	53°30.3'	8°38.3'	46°56.9'	82°07.3'	83°14.8'	91°54.7'
7	192°55.6'	S 4°18.0'	13.8'	-14.8'	57.2'	59°13.8'	57°11.5'	52°57.4'	8°10.1'	47°29.8'	82°38.2'	83°47.8'	92°25.2'
8	207°28.4'	S 4°32.8'	13.8'	-14.8'	57.3'	58°52.9'	56°52.7'	52°24.4'	7°42.5'	48°02.6'	83°09.1'	84°20.9'	92°55.8'
9	222°01.2'	S 4°47.7'	13.7'	-14.8'	57.3'	58°32.1'	56°34.0'	51°51.3'		48°35.6'	83°40.1'	84°54.0'	93°26.5'
10	236°33.9'	S 5°02.5'	13.6'	-14.8'	57.3'	58°11.3'	56°15.4'	51°18.2'		49°08.5'	84°11.1'	85°27.1'	93°57.1'
11	251°06.5'	S 5°17.3'	13.6'	-14.8'	57.4'	57°50.7'	55°57.0'	50°45.1'		49°41.5'	84°42.1'	86°00.2'	94°27.9'
12	265°39.1'	S 5°32.0'	13.5'	-14.8'	57.4'	57°30.2'	55°38.7'	50°11.9'		50°14.6'	85°13.2'	86°33.5'	94°58.6'
13	280°11.6'	S 5°46.8'	13.4'	-14.8'	57.5'	57°09.7'	55°20.5'	49°38.7'		50°47.7'	85°44.3'	87°06.7'	95°29.4'
14	294°44.0'	S 6°01.6'	13.4'	-14.8'	57.5'	56°49.4'	55°02.4'	49°05.5'		51°20.8'	86°15.5'	87°40.0'	96°00.3'
15	309°16.4'	S 6°16.4'	13.3'	-14.8'	57.5'	56°29.1'	54°44.5'	48°32.2'		51°54.0'	86°46.7'	88°13.4'	96°31.2'
16	323°48.7'	S 6°31.2'	13.2'	-14.8'	57.6'	56°09.0'	54°26.8'	47°58.9'		52°27.3'	87°17.9'	88°46.7'	97°02.1'
17	338°21.0'	S 6°45.9'	13.2'	-14.7'	57.6'	55°49.0'	54°09.1'	47°25.5'		53°00.5'	87°49.2'	89°20.2'	97°33.1'
18	352°53.1'	S 7°00.6'	13.1'	-14.7'	57.6'	55°29.1'	53°51.7'	46°52.1'		53°33.9'	88°20.6'	89°53.6'	98°04.1'
19	7°25.2'	S 7°15.4'	13.0'	-14.7'	57.7'	55°09.3'	53°34.3'	46°18.6'		54°07.2'	88°51.9'	90°27.1'	98°35.2'
20	21°57.2'	S 7°30.1'	13.0'	-14.7'	57.7'	54°49.7'	53°17.1'	45°45.1'		54°40.7'	89°23.4'	91°00.7'	99°06.3'
21	36°29.2'	S 7°44.8'	12.9'	-14.7'	57.8'	54°30.2'	53°00.1'	45°11.6'		55°14.1'	89°54.8'	91°34.3'	99°37.4'
22	51°01.1'	S 7°59.5'	12.8'	-14.7'	57.8'	54°10.8'	52°43.3'	44°38.0'		55°47.6'	90°26.3'	92°08.0'	100°08.6'
23	65°32.9'	S 8°14.1'	12.7'	-14.6'	57.8'	53°51.5'	52°26.6'	44°04.4'		56°21.2'	90°57.9'	92°41.6'	100°39.9'
Mer. pass.		18 h 29 m SD 15.5'	phase 49%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.6'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.7'	N 7°24.7'
Deneb	+1.2	49°26.8'	N 45°21.5'	Acrux	+0.8	173°02.5'	S 63°13.6'	Capella	+0.1	280°25.4'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.2'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.3'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°15.6'	N 89°21.2'
Rigil Kent	-0.0	139°42.8'	S 60°55.9'	Adhara	+1.5	255°07.9'	S 29°00.1'	Achernar	+0.5	335°21.9'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.8'				
Hadar	+0.6	148°38.7'	S 60°29.1'	Canopus	-0.6	263°53.9'	S 52°42.4'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	285°55.7'	178°44.1' N	22°29.8'	208°58.7' N	21°47.5'	278°02.6' N	1°57.6'	318°48.6' S	14°32.6'	255°32.8' N	10°26.7'	
1	300°58.2'	193°44.0' N	22°29.5'	223°57.9' N	21°47.8'	293°04.9' N	1°57.7'	333°51.2' S	14°32.6'	270°33.6' N	10°27.3'	
2	316°00.6'	208°43.9' N	22°29.3'	238°57.2' N	21°48.2'	308°07.3' N	1°57.7'	348°53.8' S	14°32.7'	285°34.4' N	10°27.9'	
3	331°03.1'	223°43.8' N	22°29.0'	253°56.4' N	21°48.6'	323°09.6' N	1°57.8'	3°56.3' S	14°32.7'	300°35.2' N	10°28.5'	
4	346°05.6'	238°43.7' N	22°28.7'	268°55.7' N	21°48.9'	338°11.9' N	1°57.8'	18°58.9' S	14°32.8'	315°36.0' N	10°29.1'	
5	1°08.0'	253°43.6' N	22°28.4'	283°55.0' N	21°49.3'	353°14.2' N	1°57.9'	34°01.5' S	14°32.8'	330°36.8' N	10°29.7'	
6	16°10.5'	268°43.5' N	22°28.1'	298°54.2' N	21°49.7'	8°16.5' N	1°57.9'	49°04.1' S	14°32.9'	345°37.6' N	10°30.3'	
7	31°13.0'	283°43.4' N	22°27.8'	313°53.5' N	21°50.0'	23°18.8' N	1°58.0'	64°06.7' S	14°32.9'	0°38.4' N	10°30.9'	
8	46°15.4'	298°43.3' N	22°27.6'	328°52.7' N	21°50.4'	38°21.1' N	1°58.0'	79°09.3' S	14°33.0'	15°39.2' N	10°31.5'	
9	61°17.9'	313°43.3' N	22°27.3'	343°52.0' N	21°50.8'	53°23.4' N	1°58.1'	94°11.8' S	14°33.0'	30°40.0' N	10°32.1'	
10	76°20.4'	328°43.2' N	22°27.0'	358°51.2' N	21°51.1'	68°25.7' N	1°58.1'	109°14.4' S	14°33.1'	45°40.8' N	10°32.8'	
11	91°22.8'	343°43.1' N	22°26.7'	13°50.5' N	21°51.5'	83°28.0' N	1°58.2'	124°17.0' S	14°33.1'	60°41.7' N	10°33.4'	
12	106°25.3'	358°43.0' N	22°26.4'	28°49.7' N	21°51.8'	98°30.3' N	1°58.3'	139°19.6' S	14°33.2'	75°42.5' N	10°34.0'	
13	121°27.7'	13°42.9' N	22°26.1'	43°49.0' N	21°52.2'	113°32.7' N	1°58.3'	154°22.2' S	14°33.2'	90°43.3' N	10°34.6'	
14	136°30.2'	28°42.8' N	22°25.8'	58°48.3' N	21°52.6'	128°35.0' N	1°58.4'	169°24.8' S	14°33.3'	105°44.1' N	10°35.2'	
15	151°32.7'	43°42.7' N	22°25.5'	73°47.5' N	21°52.9'	143°37.3' N	1°58.4'	184°27.3' S	14°33.3'	120°44.9' N	10°35.8'	
16	166°35.1'	58°42.6' N	22°25.3'	88°46.8' N	21°53.3'	158°39.6' N	1°58.5'	199°29.9' S	14°33.4'	135°45.7' N	10°36.4'	
17	181°37.6'	73°42.5' N	22°25.0'	103°46.0' N	21°53.6'	173°41.9' N	1°58.5'	214°32.5' S	14°33.4'	150°46.5' N	10°36.9'	
18	196°40.1'	88°42.4' N	22°24.7'	118°45.3' N	21°54.0'	188°44.2' N	1°58.6'	229°35.1' S	14°33.5'	165°47.3' N	10°37.5'	
19	211°42.5'	103°42.3' N	22°24.4'	133°44.5' N	21°54.3'	203°46.5' N	1°58.6'	244°37.7' S	14°33.5'	180°48.1' N	10°38.1'	
20	226°45.0'	118°42.2' N	22°24.1'	148°43.8' N	21°54.7'	218°48.8' N	1°58.7'	259°40.3' S	14°33.6'	195°48.9' N	10°38.7'	
21	241°47.5'	133°42.1' N	22°23.8'	163°43.0' N	21°55.0'	233°51.2' N	1°58.7'	274°42.8' S	14°33.6'	210°49.7' N	10°39.3'	
22	256°49.9'	148°42.0' N	22°23.5'	178°42.3' N	21°55.4'	248°53.5' N	1°58.8'	289°45.4' S	14°33.7'	225°50.5' N	10°39.9'	
23	271°52.4'	163°41.9' N	22°23.2'	193°41.5' N	21°55.7'	263°55.8' N	1°58.8'	304°48.0' S	14°33.7'	240°51.3' N	10°40.5'	
		SD 15.7' d -0.3'		v -0.7' d 0.4'		v 2.3' d 0.1'		v 2.6' d -0.0'		v 0.8' d 0.6'		
Mer. pass.		12 h 5 m 9 s		10 h 5 m		5 h 27 m		2 h 44 m		6 h 57 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Altair	-Rigil Kent	-Hadar	-Antares	+Spica	+Arcturus	+Regulus	+Sun
0	80°04.6'	S 8°28.8'	12.6'	-14.6'	57.9'	93°23.1'	53°32.4'	52°10.1'	43°30.7'			56°54.8'	101°11.2'
1	94°36.2'	S 8°43.4'	12.6'	-14.6'	57.9'	92°55.1'	53°13.4'	51°53.7'	42°57.0'			57°28.4'	101°42.5'
2	109°07.8'	S 8°58.0'	12.5'	-14.6'	57.9'	92°27.1'	52°54.6'	51°37.6'	42°23.2'			58°02.1'	102°13.9'
3	123°39.3'	S 9°12.6'	12.4'	-14.6'	58.0'	91°59.1'	52°35.9'	51°21.6'	41°49.4'			58°35.9'	102°45.3'
4	138°10.6'	S 9°27.1'	12.3'	-14.5'	58.0'	91°31.0'	52°17.4'	51°05.8'	41°15.6'			59°09.7'	103°16.7'
5	152°42.0'	S 9°41.6'	12.2'	-14.5'	58.1'	91°02.8'	51°59.0'	50°50.2'	40°41.7'			59°43.5'	103°48.3'
6	167°13.2'	S 9°56.1'	12.1'	-14.5'	58.1'	90°34.7'	51°40.8'	50°34.8'	40°07.8'			60°17.4'	104°19.8'
7	181°44.3'	S 10°10.6'	12.0'	-14.4'	58.1'	90°06.5'	51°22.8'		39°33.8'			60°51.3'	104°51.4'
8	196°15.3'	S 10°25.0'	12.0'	-14.4'	58.2'	89°38.2'	51°04.9'		38°59.8'	8°18.2'		61°25.3'	105°23.0'
9	210°46.3'	S 10°39.4'	11.9'	-14.4'	58.2'	89°09.9'	50°47.2'		38°25.7'	8°47.5'		61°59.3'	105°54.7'
10	225°17.2'	S 10°53.8'	11.8'	-14.3'	58.2'	88°41.6'	50°29.7'		37°51.6'	9°17.5'		62°33.4'	106°26.5'
11	239°47.9'	S 11°08.1'	11.7'	-14.3'	58.3'	88°13.3'	50°12.3'		37°17.5'	9°47.9'		63°07.5'	106°58.2'
12	254°18.6'	S 11°22.4'	11.6'	-14.3'	58.3'	87°44.9'	49°55.2'		36°43.3'	10°18.8'		63°41.7'	107°30.1'
13	268°49.2'	S 11°36.7'	11.5'	-14.2'	58.4'	87°16.5'	49°38.3'		36°09.1'	10°50.1'		64°15.9'	108°01.9'
14	283°19.6'	S 11°50.9'	11.4'	-14.2'	58.4'	86°48.0'	49°21.5'		35°34.8'	11°21.7'		64°50.2'	108°33.8'
15	297°50.0'	S 12°05.1'	11.3'	-14.1'	58.4'	86°19.5'	49°05.0'		35°00.5'	11°53.6'		65°24.5'	109°05.8'
16	312°20.3'	S 12°19.3'	11.2'	-14.1'	58.5'	85°51.0'	48°48.7'		34°26.1'	12°25.8'		65°58.8'	109°37.8'
17	326°50.5'	S 12°33.3'	11.1'	-14.0'	58.5'	85°22.5'	48°32.5'		33°51.8'	12°58.2'		66°33.2'	110°09.8'
18	341°20.6'	S 12°47.4'	11.0'	-14.0'	58.5'	84°53.9'	48°16.6'		33°17.3'	13°30.8'	31°52.7'	67°07.7'	110°41.9'
19	355°50.5'	S 13°01.4'	10.9'	-14.0'	58.6'	84°25.3'	48°01.0'		32°42.8'	14°03.7'	32°08.1'	67°42.2'	111°14.1'
20	10°20.4'	S 13°15.4'	10.8'	-13.9'	58.6'	83°56.6'	47°45.5'		32°08.3'	14°36.7'	32°24.0'	68°16.7'	111°46.3'
21	24°50.1'	S 13°29.3'	10.7'	-13.9'	58.7'	83°28.0'			31°33.7'	15°09.8'	32°40.3'	68°51.3'	112°18.5'
22	39°19.8'	S 13°43.1'	10.5'	-13.8'	58.7'	82°59.3'			30°59.1'	15°43.2'	32°57.0'	69°26.0'	112°50.8'
23	53°49.3'	S 13°56.9'	10.4'	-13.7'	58.7'	82°30.6'			30°24.5'	16°16.6'	33°14.2'	70°00.7'	113°23.1'
Mer. pass.		19 h 17 m SD 15.8'		phase 60%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.6'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.7'	N 7°24.7'
Deneb	+1.2	49°26.8'	N 45°21.5'	Acrux	+0.8	173°02.5'	S 63°13.6'	Capella	+0.1	280°25.4'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.2'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.3'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°15.1'	N 89°21.2'
Rigil Kent	-0.0	139°42.8'	S 60°55.9'	Adhara	+1.5	255°07.9'	S 29°00.1'	Achernar	+0.5	335°21.9'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.8'				
Hadar	+0.6	148°38.7'	S 60°29.1'	Canopus	-0.6	263°53.9'	S 52°42.4'				



h	Aries			Sun			Venus			Jupiter			Saturn			Mars		
	GHA	GHA	dec	GHA	dec		GHA	dec		GHA	dec		GHA	dec		GHA	dec	
0	286°54.9'	178°41.8'	N 22°22.9'	208°40.8'	N 21°56.1'		278°58.1'	N 1°58.9'		319°50.6'	S 14°33.8'		255°52.1'	N 10°41.1'				
1	301°57.3'	193°41.7'	N 22°22.6'	223°40.0'	N 21°56.4'		294°00.4'	N 1°58.9'		334°53.2'	S 14°33.8'		270°52.9'	N 10°41.7'				
2	316°59.8'	208°41.6'	N 22°22.3'	238°39.3'	N 21°56.8'		309°02.7'	N 1°59.0'		349°55.8'	S 14°33.9'		285°53.7'	N 10°42.3'				
3	332°02.2'	223°41.6'	N 22°22.0'	253°38.5'	N 21°57.1'		324°05.0'	N 1°59.0'		4°58.4'	S 14°33.9'		300°54.5'	N 10°42.9'				
4	347°04.7'	238°41.5'	N 22°21.7'	268°37.8'	N 21°57.4'		339°07.4'	N 1°59.1'		20°00.9'	S 14°34.0'		315°55.4'	N 10°43.5'				
5	2°07.2'	253°41.4'	N 22°21.4'	283°37.0'	N 21°57.8'		354°09.7'	N 1°59.1'		35°03.5'	S 14°34.0'		330°56.2'	N 10°44.1'				
6	17°09.6'	268°41.3'	N 22°21.1'	298°36.3'	N 21°58.1'		9°12.0'	N 1°59.2'		50°06.1'	S 14°34.1'		345°57.0'	N 10°44.7'				
7	32°12.1'	283°41.2'	N 22°20.8'	313°35.5'	N 21°58.5'		24°14.3'	N 1°59.2'		65°08.7'	S 14°34.1'		0°57.8'	N 10°45.3'				
8	47°14.6'	298°41.1'	N 22°20.5'	328°34.8'	N 21°58.8'		39°16.6'	N 1°59.3'		80°11.3'	S 14°34.2'		15°58.6'	N 10°45.9'				
9	62°17.0'	313°41.0'	N 22°20.2'	343°34.0'	N 21°59.1'		54°18.9'	N 1°59.3'		95°13.9'	S 14°34.2'		30°59.4'	N 10°46.5'				
10	77°19.5'	328°40.9'	N 22°19.9'	358°33.3'	N 21°59.5'		69°21.3'	N 1°59.4'		110°16.5'	S 14°34.2'		46°00.2'	N 10°47.1'				
11	92°22.0'	343°40.8'	N 22°19.6'	13°32.5'	N 21°59.8'		84°23.6'	N 1°59.4'		125°19.1'	S 14°34.3'		61°01.0'	N 10°47.7'				
12	107°24.4'	358°40.7'	N 22°19.3'	28°31.7'	N 22°00.1'		99°25.9'	N 1°59.5'		140°21.6'	S 14°34.3'		76°01.8'	N 10°48.3'				
13	122°26.9'	13°40.6'	N 22°19.0'	43°31.0'	N 22°00.5'		114°28.2'	N 1°59.5'		155°24.2'	S 14°34.4'		91°02.6'	N 10°48.9'				
14	137°29.3'	28°40.5'	N 22°18.7'	58°30.2'	N 22°00.8'		129°30.5'	N 1°59.6'		170°26.8'	S 14°34.4'		106°03.4'	N 10°49.5'				
15	152°31.8'	43°40.5'	N 22°18.4'	73°29.5'	N 22°01.1'		144°32.8'	N 1°59.6'		185°29.4'	S 14°34.5'		121°04.2'	N 10°50.1'				
16	167°34.3'	58°40.4'	N 22°18.1'	88°28.7'	N 22°01.5'		159°35.2'	N 1°59.7'		200°32.0'	S 14°34.5'		136°05.0'	N 10°50.7'				
17	182°36.7'	73°40.3'	N 22°17.8'	103°28.0'	N 22°01.8'		174°37.5'	N 1°59.7'		215°34.6'	S 14°34.6'		151°05.8'	N 10°51.3'				
18	197°39.2'	88°40.2'	N 22°17.5'	118°27.2'	N 22°02.1'		189°39.8'	N 1°59.8'		230°37.2'	S 14°34.6'		166°06.7'	N 10°51.9'				
19	212°41.7'	103°40.1'	N 22°17.2'	133°26.5'	N 22°02.4'		204°42.1'	N 1°59.8'		245°39.8'	S 14°34.7'		181°07.5'	N 10°52.5'				
20	227°44.1'	118°40.0'	N 22°16.8'	148°25.7'	N 22°02.8'		219°44.4'	N 1°59.9'		260°42.3'	S 14°34.7'		196°08.3'	N 10°53.0'				
21	242°46.6'	133°39.9'	N 22°16.5'	163°24.9'	N 22°03.1'		234°46.8'	N 1°59.9'		275°44.9'	S 14°34.8'		211°09.1'	N 10°53.6'				
22	257°49.1'	148°39.8'	N 22°16.2'	178°24.2'	N 22°03.4'		249°49.1'	N 1°60.0'		290°47.5'	S 14°34.8'		226°09.9'	N 10°54.2'				
23	272°51.5'	163°39.7'	N 22°15.9'	193°23.4'	N 22°03.7'		264°51.4'	N 2°00.0'		305°50.1'	S 14°34.9'		241°10.7'	N 10°54.8'				
			SD 15.7' d -0.3'	v -0.8' d 0.3'			v 2.3' d 0.0'			v 2.6' d -0.0'			v 0.8' d 0.6'					
Mer. pass.			12 h 5 m 18 s	10 h 6 m			5 h 23 m			2 h 40 m			6 h 56 m					

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Achernar	-Saturn	-Altair	-Antares	+Spica	+Arcturus	+Regulus	+Sun
0	68°18.8'	S 14°10.6'	10.3'	-13.7'	58.8'	107°45.9'	103°38.0'	82°01.8'	29°49.8'	16°50.2'	33°31.9'	70°35.4'	113°55.5'
1	82°48.1'	S 14°24.3'	10.2'	-13.6'	58.8'	107°27.9'	103°03.0'	81°33.1'	29°15.1'	17°24.0'	33°49.9'	71°10.2'	114°27.9'
2	97°17.3'	S 14°37.9'	10.1'	-13.6'	58.9'	107°09.7'	102°28.0'	81°04.3'	28°40.3'	17°57.8'	34°08.3'	71°45.0'	115°00.3'
3	111°46.4'	S 14°51.5'	10.0'	-13.5'	58.9'	106°51.5'	101°53.0'	80°35.5'	28°05.5'	18°31.8'	34°27.2'	72°19.9'	115°32.8'
4	126°15.4'	S 15°05.0'	9.9'	-13.4'	58.9'	106°33.1'	101°17.9'	80°06.7'	27°30.7'	19°05.8'	34°46.4'	72°54.8'	116°05.4'
5	140°44.2'	S 15°18.4'	9.7'	-13.4'	59.0'	106°14.6'	100°42.7'	79°37.8'	26°55.8'	19°40.0'	35°06.1'	73°29.8'	116°38.0'
6	155°13.0'	S 15°31.8'	9.6'	-13.3'	59.0'	105°56.1'	100°07.5'	79°09.0'	26°20.8'	20°14.3'	35°26.1'	74°04.8'	117°10.6'
7	169°41.6'	S 15°45.1'	9.5'	-13.2'	59.0'	105°37.4'	99°32.3'	78°40.1'	25°45.9'	20°48.6'	35°46.4'	74°39.9'	117°43.3'
8	184°10.1'	S 15°58.4'	9.4'	-13.2'	59.1'	105°18.7'	98°57.0'	78°11.2'	25°10.9'	21°23.1'	36°07.1'	75°15.0'	118°16.0'
9	198°38.5'	S 16°11.5'	9.3'	-13.1'	59.1'	104°59.8'	98°21.7'	77°42.3'	24°35.9'	21°57.6'	36°28.2'	75°50.2'	118°48.8'
10	213°06.8'	S 16°24.6'	9.2'	-13.0'	59.2'	104°40.9'	97°46.3'	77°13.4'	24°00.8'	22°32.2'	36°49.6'	76°25.4'	119°21.6'
11	227°35.0'	S 16°37.6'	9.0'	-12.9'	59.2'	104°21.8'	97°10.9'	76°44.5'	23°25.7'	23°06.9'	37°11.4'	77°00.6'	119°54.5'
12	242°03.0'	S 16°50.5'	8.9'	-12.9'	59.2'	104°02.7'	96°35.4'	76°15.5'	22°50.6'	23°41.7'	37°33.4'	77°36.0'	
13	256°30.9'	S 17°03.4'	8.8'	-12.8'	59.3'	103°43.5'	95°59.9'	75°46.6'	22°15.4'	24°16.5'	37°55.8'	78°11.3'	
14	270°58.7'	S 17°16.2'	8.7'	-12.7'	59.3'	103°24.1'	95°24.4'	75°17.6'	21°40.2'	24°51.4'	38°18.5'	78°46.7'	
15	285°26.3'	S 17°28.9'	8.5'	-12.6'	59.3'	103°04.8'	94°48.7'	74°48.7'	21°05.0'	25°26.4'	38°41.5'	79°22.1'	
16	299°53.9'	S 17°41.5'	8.4'	-12.5'	59.4'	102°45.3'	94°13.1'	74°19.7'	20°29.7'	26°01.5'	39°04.8'	79°57.6'	
17	314°21.3'	S 17°54.0'	8.3'	-12.4'	59.4'	102°25.7'	93°37.4'	73°50.8'	19°54.5'	26°36.6'	39°28.4'	80°33.2'	
18	328°48.5'	S 18°06.4'	8.1'	-12.3'	59.4'	102°06.1'	93°01.6'	73°21.8'	19°19.2'	27°11.8'	39°52.3'	81°08.8'	
19	343°15.7'	S 18°18.7'	8.0'	-12.2'	59.5'	101°46.3'	92°25.8'	72°52.8'	18°43.9'	27°47.1'	40°16.4'	81°44.4'	
20	357°42.7'	S 18°31.0'	7.9'	-12.1'	59.5'	101°26.5'	91°50.0'	72°23.9'	18°08.5'	28°22.4'	40°40.8'	82°20.1'	
21	12°09.6'	S 18°43.1'	7.8'	-12.1'	59.6'	101°06.6'	91°14.1'	71°54.9'	17°33.2'	28°57.8'	41°05.5'	82°55.8'	
22	26°36.3'	S 18°55.2'	7.6'	-12.0'	59.6'	100°46.7'	90°38.2'	71°26.0'	16°57.8'	29°33.2'	41°30.4'	83°31.5'	
23	41°03.0'	S 19°07.1'	7.5'	-11.9'	59.6'	100°26.7'	90°02.2'	70°57.0'	16°22.4'	30°08.7'	41°55.5'	84°07.4'	
Mer. pass. 20 h 10 m SD 16.0' phase 70%													

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.6'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.7'	N 7°24.7'
Deneb	+1.2	49°26.8'	N 45°21.5'	Acrux	+0.8	173°02.5'	S 63°13.6'	Capella	+0.1	280°25.4'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.2'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.3'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°14.6'	N 89°21.2'
Rigil Kent	-0.0	139°42.9'	S 60°55.9'	Adhara	+1.5	255°07.9'	S 29°00.1'	Achernar	+0.5	335°21.9'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.8'				
Hadar	+0.6	148°38.7'	S 60°29.1'	Canopus	-0.6	263°53.9'	S 52°42.4'				

Sunday 10 July 2022 UT1

h	Aries	Sun		Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	287°54.0'	178°39.7'	N 22°15.6'	208°22.7'	N 22°04.1'	279°53.7'	N 2°00.1'	320°52.7'	S 14°34.9'	256°11.5'	N 10°55.4'
1	302°56.5'	193°39.6'	N 22°15.3'	223°21.9'	N 22°04.4'	294°56.0'	N 2°00.1'	335°55.3'	S 14°35.0'	271°12.3'	N 10°56.0'
2	317°58.9'	208°39.5'	N 22°15.0'	238°21.2'	N 22°04.7'	309°58.4'	N 2°00.2'	350°57.9'	S 14°35.0'	286°13.1'	N 10°56.6'
3	333°01.4'	223°39.4'	N 22°14.7'	253°20.4'	N 22°05.0'	325°00.7'	N 2°00.2'	6°00.5'	S 14°35.1'	301°13.9'	N 10°57.2'
4	348°03.8'	238°39.3'	N 22°14.3'	268°19.6'	N 22°05.3'	340°03.0'	N 2°00.3'	21°03.0'	S 14°35.1'	316°14.7'	N 10°57.8'
5	3°06.3'	253°39.2'	N 22°14.0'	283°18.9'	N 22°05.6'	355°05.3'	N 2°00.3'	36°05.6'	S 14°35.2'	331°15.5'	N 10°58.4'
6	18°08.8'	268°39.1'	N 22°13.7'	298°18.1'	N 22°06.0'	10°07.7'	N 2°00.4'	51°08.2'	S 14°35.2'	346°16.3'	N 10°59.0'
7	33°11.2'	283°39.0'	N 22°13.4'	313°17.4'	N 22°06.3'	25°10.0'	N 2°00.4'	66°10.8'	S 14°35.3'	1°17.2'	N 10°59.6'
8	48°13.7'	298°38.9'	N 22°13.1'	328°16.6'	N 22°06.6'	40°12.3'	N 2°00.4'	81°13.4'	S 14°35.3'	16°18.0'	N 11°00.2'
9	63°16.2'	313°38.9'	N 22°12.8'	343°15.8'	N 22°06.9'	55°14.6'	N 2°00.5'	96°16.0'	S 14°35.4'	31°18.8'	N 11°00.7'
10	78°18.6'	328°38.8'	N 22°12.4'	358°15.1'	N 22°07.2'	70°16.9'	N 2°00.5'	111°18.6'	S 14°35.4'	46°19.6'	N 11°01.3'
11	93°21.1'	343°38.7'	N 22°12.1'	13°14.3'	N 22°07.5'	85°19.3'	N 2°00.6'	126°21.2'	S 14°35.5'	61°20.4'	N 11°01.9'
12	108°23.6'	358°38.6'	N 22°11.8'	28°13.6'	N 22°07.8'	100°21.6'	N 2°00.6'	141°23.8'	S 14°35.5'	76°21.2'	N 11°02.5'
13	123°26.0'	13°38.5'	N 22°11.5'	43°12.8'	N 22°08.1'	115°23.9'	N 2°00.7'	156°26.4'	S 14°35.6'	91°22.0'	N 11°03.1'
14	138°28.5'	28°38.4'	N 22°11.2'	58°12.0'	N 22°08.4'	130°26.2'	N 2°00.7'	171°28.9'	S 14°35.6'	106°22.8'	N 11°03.7'
15	153°31.0'	43°38.3'	N 22°10.8'	73°11.3'	N 22°08.7'	145°28.6'	N 2°00.8'	186°31.5'	S 14°35.7'	121°23.6'	N 11°04.3'
16	168°33.4'	58°38.3'	N 22°10.5'	88°10.5'	N 22°09.1'	160°30.9'	N 2°00.8'	201°34.1'	S 14°35.7'	136°24.4'	N 11°04.9'
17	183°35.9'	73°38.2'	N 22°10.2'	103°09.7'	N 22°09.4'	175°33.2'	N 2°00.9'	216°36.7'	S 14°35.8'	151°25.2'	N 11°05.5'
18	198°38.3'	88°38.1'	N 22°09.9'	118°09.0'	N 22°09.7'	190°35.5'	N 2°00.9'	231°39.3'	S 14°35.8'	166°26.0'	N 11°06.1'
19	213°40.8'	103°38.0'	N 22°09.5'	133°08.2'	N 22°10.0'	205°37.9'	N 2°01.0'	246°41.9'	S 14°35.9'	181°26.9'	N 11°06.6'
20	228°43.3'	118°37.9'	N 22°09.2'	148°07.5'	N 22°10.3'	220°40.2'	N 2°01.0'	261°44.5'	S 14°35.9'	196°27.7'	N 11°07.2'
21	243°45.7'	133°37.8'	N 22°08.9'	163°06.7'	N 22°10.6'	235°42.5'	N 2°01.0'	276°47.1'	S 14°36.0'	211°28.5'	N 11°07.8'
22	258°48.2'	148°37.7'	N 22°08.6'	178°05.9'	N 22°10.9'	250°44.9'	N 2°01.1'	291°49.7'	S 14°36.0'	226°29.3'	N 11°08.4'
23	273°50.7'	163°37.7'	N 22°08.2'	193°05.2'	N 22°11.2'	265°47.2'	N 2°01.1'	306°52.3'	S 14°36.1'	241°30.1'	N 11°09.0'
		SD 15.7' d -0.3'		v -0.8' d 0.3'		v 2.3' d 0.0'		v 2.6' d -0.1'		v 0.8' d 0.6'	
Mer. pass.		12 h 5 m 26 s		10 h 7 m		5 h 20 m		2 h 36 m		6 h 55 m	

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Deneb	-Saturn	-Altair	-Antares	+Spica	+Arcturus	+Regulus	+Procyon
0	55°29.5'	S 19°19.0'	7.4'	-11.7'	59.7'								
1	69°55.8'	S 19°30.7'	7.2'	-11.6'	59.7'	95°26.4'	88°50.1'	69°59.2'	15°11.7'	31°19.9'	42°46.6'	85°19.1'	117°59.5'
2	84°22.1'	S 19°42.4'	7.1'	-11.5'	59.7'	95°11.3'	88°14.0'	69°30.3'	14°36.3'	31°55.6'	43°12.5'	85°55.1'	118°32.5'
3	98°48.2'	S 19°53.9'	7.0'	-11.4'	59.8'	94°56.2'	87°37.9'	69°01.4'	14°01.0'	32°31.3'	43°38.6'	86°31.0'	119°05.6'
4	113°14.1'	S 20°05.3'	6.8'	-11.3'	59.8'	94°41.1'	87°01.7'	68°32.5'	13°25.7'	33°07.1'	44°04.9'	87°07.1'	119°38.6'
5	127°40.0'	S 20°16.7'	6.7'	-11.2'	59.8'	94°25.9'	86°25.4'	68°03.7'	12°50.4'	33°43.0'	44°31.5'	87°43.2'	
6	142°05.7'	S 20°27.9'	6.6'	-11.1'	59.9'	94°10.7'	85°49.2'	67°34.8'	12°15.1'	34°18.9'	44°58.2'	88°19.3'	
7	156°31.3'	S 20°38.9'	6.4'	-11.0'	59.9'	93°55.4'	85°12.8'	67°06.0'	11°39.9'	34°54.8'	45°25.2'	88°55.4'	
8	170°56.7'	S 20°49.9'	6.3'	-10.8'	59.9'	93°40.1'	84°36.5'	66°37.3'	11°04.8'	35°30.8'	45°52.3'	89°31.6'	
9	185°22.0'	S 21°00.7'	6.2'	-10.7'	60.0'	93°24.8'	84°00.1'	66°08.5'	10°29.8'	36°06.9'	46°19.7'	90°07.9'	
10	199°47.2'	S 21°11.5'	6.0'	-10.6'	60.0'	93°09.4'	83°23.6'	65°39.8'	9°54.9'	36°43.0'	46°47.2'	90°44.2'	
11	214°12.2'	S 21°22.1'	5.9'	-10.5'	60.0'	92°54.0'	82°47.1'	65°11.1'	9°20.2'	37°19.2'	47°14.9'	91°20.5'	
12	228°37.1'	S 21°32.5'	5.8'	-10.3'	60.1'	92°38.5'	82°10.6'	64°42.4'	8°45.6'	37°55.4'	47°42.8'	91°56.9'	
13	243°01.9'	S 21°42.9'	5.6'	-10.2'	60.1'	92°23.1'	81°34.0'	64°13.8'	8°11.3'	38°31.6'	48°10.9'	92°33.3'	
14	257°26.5'	S 21°53.1'	5.5'	-10.1'	60.1'	92°07.5'	80°57.4'	63°45.2'	7°37.2'	39°07.9'	48°39.2'	93°09.8'	
15	271°51.0'	S 22°03.2'	5.4'	-9.9'	60.2'	91°52.0'	80°20.7'	63°16.7'	7°03.6'	39°44.3'	49°07.6'	93°46.3'	
16	286°15.4'	S 22°13.1'	5.2'	-9.8'	60.2'	91°36.4'	79°44.0'	62°48.2'	6°30.4'	40°20.7'	49°36.2'	94°22.8'	
17	300°39.6'	S 22°22.9'	5.1'	-9.7'	60.2'	91°20.8'	79°07.3'	62°19.8'		40°57.1'	50°05.0'	94°59.4'	
18	315°03.8'	S 22°32.6'	5.0'	-9.5'	60.3'	91°05.2'	78°30.5'	61°51.4'		41°33.6'	50°33.9'	95°36.0'	
19	329°27.7'	S 22°42.1'	4.9'	-9.4'	60.3'	90°49.6'	77°53.7'	61°23.0'		42°10.2'	51°02.9'	96°12.7'	
20	343°51.6'	S 22°51.5'	4.7'	-9.2'	60.3'	90°33.9'	77°16.8'	60°54.8'		42°46.8'	51°32.1'	96°49.3'	
21	358°15.3'	S 23°00.7'	4.6'	-9.1'	60.3'	90°18.2'	76°39.9'	60°26.5'		43°23.4'	52°01.5'	97°26.1'	
22	12°38.9'	S 23°09.8'	4.5'	-8.9'	60.4'	90°02.5'	76°03.0'	59°58.4'		44°00.0'	52°31.0'	98°02.9'	
23	27°02.4'	S 23°18.7'	4.3'	-8.8'	60.4'	89°46.8'	75°26.0'	59°30.3'		44°36.8'	53°00.6'	98°39.7'	
Mer. pass.		21 h 7 m SD 16.3'	phase 80%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.6'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.8'	N 45°21.5'	Acrux	+0.8	173°02.5'	S 63°13.6'	Capella	+0.1	280°25.4'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.2'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.3'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°14.1'	N 89°21.2'
Rigil Kent	-0.0	139°42.9'	S 60°55.9'	Adhara	+1.5	255°07.9'	S 29°00.1'	Achernar	+0.5	335°21.9'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.8'				
Hadar	+0.6	148°38.7'	S 60°29.1'	Canopus	-0.6	263°53.9'	S 52°42.4'				

Monday 11 July 2022 UT1

h	Aries			Sun			Venus			Jupiter			Saturn			Mars		
	GHA	GHA	dec	GHA	dec		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	288°53.1'	178°37.6'	N 22°07.9'	208°04.4'	N 22°11.5'		280°49.5'	N 2°01.2'	321°54.8'	S 14°36.1'	256°30.9'	N 11°09.6'						
1	303°55.6'	193°37.5'	N 22°07.6'	223°03.6'	N 22°11.7'		295°51.8'	N 2°01.2'	336°57.4'	S 14°36.2'	271°31.7'	N 11°10.2'						
2	318°58.1'	208°37.4'	N 22°07.2'	238°02.9'	N 22°12.0'		310°54.2'	N 2°01.3'	352°00.0'	S 14°36.2'	286°32.5'	N 11°10.8'						
3	334°00.5'	223°37.3'	N 22°06.9'	253°02.1'	N 22°12.3'		325°56.5'	N 2°01.3'	7°02.6'	S 14°36.3'	301°33.3'	N 11°11.3'						
4	349°03.0'	238°37.2'	N 22°06.6'	268°01.3'	N 22°12.6'		340°58.8'	N 2°01.4'	22°05.2'	S 14°36.3'	316°34.1'	N 11°11.9'						
5	4°05.5'	253°37.2'	N 22°06.3'	283°00.6'	N 22°12.9'		356°01.2'	N 2°01.4'	37°07.8'	S 14°36.4'	331°34.9'	N 11°12.5'						
6	19°07.9'	268°37.1'	N 22°05.9'	297°59.8'	N 22°13.2'		11°03.5'	N 2°01.5'	52°10.4'	S 14°36.4'	346°35.8'	N 11°13.1'						
7	34°10.4'	283°37.0'	N 22°05.6'	312°59.0'	N 22°13.5'		26°05.8'	N 2°01.5'	67°13.0'	S 14°36.5'	1°36.6'	N 11°13.7'						
8	49°12.8'	298°36.9'	N 22°05.3'	327°58.3'	N 22°13.8'		41°08.1'	N 2°01.5'	82°15.6'	S 14°36.5'	16°37.4'	N 11°14.3'						
9	64°15.3'	313°36.8'	N 22°04.9'	342°57.5'	N 22°14.1'		56°10.5'	N 2°01.6'	97°18.2'	S 14°36.6'	31°38.2'	N 11°14.9'						
10	79°17.8'	328°36.8'	N 22°04.6'	357°56.7'	N 22°14.4'		71°12.8'	N 2°01.6'	112°20.8'	S 14°36.6'	46°39.0'	N 11°15.4'						
11	94°20.2'	343°36.7'	N 22°04.3'	12°56.0'	N 22°14.6'		86°15.1'	N 2°01.7'	127°23.4'	S 14°36.7'	61°39.8'	N 11°16.0'						
12	109°22.7'	358°36.6'	N 22°03.9'	27°55.2'	N 22°14.9'		101°17.5'	N 2°01.7'	142°26.0'	S 14°36.7'	76°40.6'	N 11°16.6'						
13	124°25.2'	13°36.5'	N 22°03.6'	42°54.4'	N 22°15.2'		116°19.8'	N 2°01.8'	157°28.5'	S 14°36.8'	91°41.4'	N 11°17.2'						
14	139°27.6'	28°36.4'	N 22°03.2'	57°53.7'	N 22°15.5'		131°22.1'	N 2°01.8'	172°31.1'	S 14°36.8'	106°42.2'	N 11°17.8'						
15	154°30.1'	43°36.3'	N 22°02.9'	72°52.9'	N 22°15.8'		146°24.5'	N 2°01.8'	187°33.7'	S 14°36.9'	121°43.0'	N 11°18.4'						
16	169°32.6'	58°36.3'	N 22°02.6'	87°52.1'	N 22°16.0'		161°26.8'	N 2°01.9'	202°36.3'	S 14°37.0'	136°43.9'	N 11°19.0'						
17	184°35.0'	73°36.2'	N 22°02.2'	102°51.3'	N 22°16.3'		176°29.1'	N 2°01.9'	217°38.9'	S 14°37.0'	151°44.7'	N 11°19.5'						
18	199°37.5'	88°36.1'	N 22°01.9'	117°50.6'	N 22°16.6'		191°31.5'	N 2°02.0'	232°41.5'	S 14°37.1'	166°45.5'	N 11°20.1'						
19	214°40.0'	103°36.0'	N 22°01.6'	132°49.8'	N 22°16.9'		206°33.8'	N 2°02.0'	247°44.1'	S 14°37.1'	181°46.3'	N 11°20.7'						
20	229°42.4'	118°35.9'	N 22°01.2'	147°49.0'	N 22°17.1'		221°36.1'	N 2°02.1'	262°46.7'	S 14°37.2'	196°47.1'	N 11°21.3'						
21	244°44.9'	133°35.9'	N 22°00.9'	162°48.3'	N 22°17.4'		236°38.5'	N 2°02.1'	277°49.3'	S 14°37.2'	211°47.9'	N 11°21.9'						
22	259°47.3'	148°35.8'	N 22°00.5'	177°47.5'	N 22°17.7'		251°40.8'	N 2°02.1'	292°51.9'	S 14°37.3'	226°48.7'	N 11°22.5'						
23	274°49.8'	163°35.7'	N 22°00.2'	192°46.7'	N 22°18.0'		266°43.1'	N 2°02.2'	307°54.5'	S 14°37.3'	241°49.5'	N 11°23.0'						
		SD 15.7' d -0.3'		v -0.8' d 0.3'			v 2.3' d 0.0'		v 2.6' d -0.1'		v 0.8' d 0.6'							
Mer. pass.		12 h 5 m 34 s		10 h 8 m			5 h 16 m		2 h 32 m		6 h 54 m							

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Fomalhaut	-Saturn	-Altair	-Antares	+Hadar	+Spica	+Arcturus	+Regulus
0	41°25.7'	S 23°27.5'	4.2'	-8.6'	60.4'	84°32.8'	74°49.0'	59°02.3'			45°13.5'	53°30.4'	99°16.5'
1	55°48.9'	S 23°36.1'	4.1'	-8.5'	60.5'	83°57.3'	74°11.9'	58°34.4'			45°50.3'	54°00.3'	99°53.4'
2	70°12.0'	S 23°44.6'	4.0'	-8.3'	60.5'	83°21.7'	73°34.9'	58°06.5'			46°27.1'	54°30.4'	100°30.3'
3	84°35.0'	S 23°52.9'	3.8'	-8.1'	60.5'	82°46.1'	72°57.7'	57°38.7'			47°04.0'	55°00.5'	101°07.3'
4	98°57.8'	S 24°01.0'	3.7'	-8.0'	60.5'	82°10.5'	72°20.6'	57°11.0'			47°40.9'	55°30.8'	101°44.3'
5	113°20.6'	S 24°09.0'	3.6'	-7.8'	60.6'	81°34.8'	71°43.4'	56°43.4'			48°17.9'	56°01.2'	102°21.3'
6	127°43.2'	S 24°16.8'	3.5'	-7.7'	60.6'	80°59.2'	71°06.2'	56°15.9'			48°54.9'	56°31.7'	102°58.3'
7	142°05.6'	S 24°24.5'	3.4'	-7.5'	60.6'	80°23.5'	70°28.9'	55°48.4'			49°31.9'	57°02.4'	103°35.4'
8	156°28.0'	S 24°32.0'	3.3'	-7.3'	60.6'	79°47.7'	69°51.6'	55°21.1'			50°09.0'	57°33.1'	104°12.6'
9	170°50.3'	S 24°39.3'	3.1'	-7.1'	60.7'	79°12.0'	69°14.3'	54°53.9'			50°46.1'	58°04.0'	104°49.7'
10	185°12.4'	S 24°46.4'	3.0'	-7.0'	60.7'	78°36.2'	68°36.9'	54°26.8'			51°23.2'	58°35.0'	105°26.9'
11	199°34.4'	S 24°53.4'	2.9'	-6.8'	60.7'	78°00.4'	67°59.5'	53°59.8'	6°33.7'		52°00.4'	59°06.0'	106°04.1'
12	213°56.4'	S 25°00.2'	2.8'	-6.6'	60.7'	77°24.6'	67°22.1'	53°32.9'	7°07.5'		52°37.6'	59°37.2'	106°41.4'
13	228°18.2'	S 25°06.8'	2.7'	-6.4'	60.8'	76°48.7'	66°44.7'	53°06.2'	7°42.0'		53°14.9'	60°08.5'	107°18.7'
14	242°39.9'	S 25°13.2'	2.6'	-6.2'	60.8'	76°12.8'	66°07.2'	52°39.6'	8°16.9'		53°52.2'	60°39.8'	107°56.0'
15	257°01.5'	S 25°19.5'	2.5'	-6.1'	60.8'	75°36.9'	65°29.7'	52°13.1'	8°52.2'		54°29.5'	61°11.3'	108°33.3'
16	271°23.0'	S 25°25.5'	2.4'	-5.9'	60.8'	75°01.0'	64°52.2'	51°46.7'	9°27.7'		55°06.8'	61°42.8'	109°10.7'
17	285°44.4'	S 25°31.4'	2.3'	-5.7'	60.9'	74°25.1'	64°14.6'	51°20.5'	10°03.6'		55°44.2'	62°14.5'	109°48.1'
18	300°05.7'	S 25°37.1'	2.2'	-5.5'	60.9'	73°49.1'	63°37.0'	50°54.5'	10°39.6'		56°21.6'	62°46.2'	110°25.5'
19	314°26.9'	S 25°42.6'	2.1'	-5.3'	60.9'	73°13.2'	62°59.4'	50°28.6'	11°15.9'		56°59.0'	63°18.0'	111°03.0'
20	328°48.0'	S 25°47.9'	2.0'	-5.1'	60.9'	72°37.2'	62°21.7'	50°02.8'	11°52.3'		57°36.5'	63°49.9'	111°40.5'
21	343°09.0'	S 25°53.1'	1.9'	-4.9'	60.9'	72°01.2'	61°44.1'	49°37.2'	12°28.8'		58°14.0'	64°21.9'	112°18.0'
22	357°30.0'	S 25°58.0'	1.9'	-4.7'	61.0'	71°25.2'	61°06.4'	49°11.8'	13°05.5'	48°41.3'	58°51.5'	64°53.9'	112°55.5'
23	11°50.8'	S 26°02.7'	1.8'	-4.5'	61.0'	70°49.1'	60°28.6'	48°46.6'	13°42.3'	48°56.3'	59°29.1'	65°26.0'	113°33.1'
Mer. pass.		22 h 10 m SD 16.5'		phase 89%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.6'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.5'	Acrux	+0.8	173°02.5'	S 63°13.6'	Capella	+0.1	280°25.4'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.3'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°13.5'	N 89°21.2'
Rigel Kent	-0.0	139°42.9'	S 60°55.9'	Adhara	+1.5	255°07.9'	S 29°00.1'	Achernar	+0.5	335°21.8'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.8'				
Hadar	+0.6	148°38.7'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

Tuesday 12 July 2022 UT1

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	GHA dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	289°52.3'	178°35.6' N 21°59.8'	207°45.9' N 22°18.2'	281°45.5' N 2°02.2'	322°57.1' S 14°37.4'	256°50.3' N 11°23.6'						
1	304°54.7'	193°35.5' N 21°59.5'	222°45.2' N 22°18.5'	296°47.8' N 2°02.3'	337°59.7' S 14°37.4'	271°51.1' N 11°24.2'						
2	319°57.2'	208°35.5' N 21°59.1'	237°44.4' N 22°18.8'	311°50.1' N 2°02.3'	353°02.3' S 14°37.5'	286°52.0' N 11°24.8'						
3	334°59.7'	223°35.4' N 21°58.8'	252°43.6' N 22°19.0'	326°52.5' N 2°02.4'	8°04.9' S 14°37.5'	301°52.8' N 11°25.4'						
4	350°02.1'	238°35.3' N 21°58.5'	267°42.9' N 22°19.3'	341°54.8' N 2°02.4'	23°07.5' S 14°37.6'	316°53.6' N 11°25.9'						
5	5°04.6'	253°35.2' N 21°58.1'	282°42.1' N 22°19.6'	356°57.1' N 2°02.4'	38°10.0' S 14°37.6'	331°54.4' N 11°26.5'						
6	20°07.1'	268°35.2' N 21°57.8'	297°41.3' N 22°19.8'	11°59.5' N 2°02.5'	53°12.6' S 14°37.7'	346°55.2' N 11°27.1'						
7	35°09.5'	283°35.1' N 21°57.4'	312°40.5' N 22°20.1'	27°01.8' N 2°02.5'	68°15.2' S 14°37.7'	1°56.0' N 11°27.7'						
8	50°12.0'	298°35.0' N 21°57.1'	327°39.8' N 22°20.4'	42°04.2' N 2°02.6'	83°17.8' S 14°37.8'	16°56.8' N 11°28.3'						
9	65°14.5'	313°34.9' N 21°56.7'	342°39.0' N 22°20.6'	57°06.5' N 2°02.6'	98°20.4' S 14°37.8'	31°57.6' N 11°28.8'						
10	80°16.9'	328°34.8' N 21°56.4'	357°38.2' N 22°20.9'	72°08.8' N 2°02.6'	113°23.0' S 14°37.9'	46°58.4' N 11°29.4'						
11	95°19.4'	343°34.8' N 21°56.0'	12°37.4' N 22°21.1'	87°11.2' N 2°02.7'	128°25.6' S 14°37.9'	61°59.3' N 11°30.0'						
12	110°21.8'	358°34.7' N 21°55.7'	27°36.7' N 22°21.4'	102°13.5' N 2°02.7'	143°28.2' S 14°38.0'	77°00.1' N 11°30.6'						
13	125°24.3'	13°34.6' N 21°55.3'	42°35.9' N 22°21.7'	117°15.8' N 2°02.8'	158°30.8' S 14°38.0'	92°00.9' N 11°31.2'						
14	140°26.8'	28°34.5' N 21°55.0'	57°35.1' N 22°21.9'	132°18.2' N 2°02.8'	173°33.4' S 14°38.1'	107°01.7' N 11°31.7'						
15	155°29.2'	43°34.5' N 21°54.6'	72°34.3' N 22°22.2'	147°20.5' N 2°02.8'	188°36.0' S 14°38.1'	122°02.5' N 11°32.3'						
16	170°31.7'	58°34.4' N 21°54.3'	87°33.5' N 22°22.4'	162°22.9' N 2°02.9'	203°38.6' S 14°38.2'	137°03.3' N 11°32.9'						
17	185°34.2'	73°34.3' N 21°53.9'	102°32.8' N 22°22.7'	177°25.2' N 2°02.9'	218°41.2' S 14°38.2'	152°04.1' N 11°33.5'						
18	200°36.6'	88°34.2' N 21°53.5'	117°32.0' N 22°22.9'	192°27.5' N 2°03.0'	233°43.8' S 14°38.3'	167°04.9' N 11°34.1'						
19	215°39.1'	103°34.2' N 21°53.2'	132°31.2' N 22°23.2'	207°29.9' N 2°03.0'	248°46.4' S 14°38.3'	182°05.8' N 11°34.6'						
20	230°41.6'	118°34.1' N 21°52.8'	147°30.4' N 22°23.4'	222°32.2' N 2°03.0'	263°49.0' S 14°38.4'	197°06.6' N 11°35.2'						
21	245°44.0'	133°34.0' N 21°52.5'	162°29.7' N 22°23.7'	237°34.6' N 2°03.1'	278°51.6' S 14°38.4'	212°07.4' N 11°35.8'						
22	260°46.5'	148°33.9' N 21°52.1'	177°28.9' N 22°23.9'	252°36.9' N 2°03.1'	293°54.2' S 14°38.5'	227°08.2' N 11°36.4'						
23	275°49.0'	163°33.9' N 21°51.8'	192°28.1' N 22°24.2'	267°39.3' N 2°03.2'	308°56.8' S 14°38.6'	242°09.0' N 11°37.0'						
		SD 15.7' d -0.4'	v -0.8' d 0.3'	v 2.3' d 0.0'	v 2.6' d -0.1'	v 0.8' d 0.6'						
Mer. pass.		12 h 5 m 42 s	10 h 9 m	5 h 12 m	2 h 28 m	6 h 52 m						

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Achernar	-Fomalhaut	-Saturn	-Altair	+Antares	+Rigil Kent	+Hadar	+Spica
0	26°11.6'	S 26°07.3'	1.7'	-4.3'	61.0'	83°10.0'	70°13.1'	59°50.9'	48°21.6'	14°19.2'		49°11.7'	60°06.6'
1	40°32.3'	S 26°11.6'	1.6'	-4.1'	61.0'	82°48.5'	69°37.1'	59°13.1'	47°56.7'	14°56.2'		49°27.3'	60°44.2'
2	54°52.9'	S 26°15.7'	1.5'	-3.9'	61.0'	82°27.1'	69°01.0'	58°35.3'	47°32.0'	15°33.3'		49°43.3'	61°21.9'
3	69°13.4'	S 26°19.7'	1.5'	-3.7'	61.0'	82°05.6'	68°24.9'	57°57.5'	47°07.6'	16°10.4'		49°59.5'	61°59.5'
4	83°33.9'	S 26°23.4'	1.4'	-3.5'	61.1'	81°44.2'	67°48.9'	57°19.7'	46°43.4'	16°47.6'	46°23.1'	50°16.1'	62°37.2'
5	97°54.3'	S 26°26.9'	1.3'	-3.3'	61.1'	81°22.8'	67°12.8'	56°41.8'	46°19.3'	17°24.9'	46°38.3'	50°32.9'	63°14.9'
6	112°14.6'	S 26°30.3'	1.3'	-3.1'	61.1'	81°01.5'	66°36.7'	56°04.0'	45°55.5'	18°02.3'	46°53.8'	50°50.0'	63°52.6'
7	126°34.9'	S 26°33.4'	1.2'	-2.9'	61.1'	80°40.2'	66°00.6'	55°26.1'	45°32.0'	18°39.7'	47°09.7'	51°07.4'	64°30.4'
8	140°55.1'	S 26°36.3'	1.2'	-2.7'	61.1'	80°18.9'	65°24.5'	54°48.2'	45°08.7'	19°17.1'	47°26.0'	51°25.1'	65°08.2'
9	155°15.3'	S 26°39.0'	1.1'	-2.5'	61.1'	79°57.7'	64°48.5'	54°10.2'	44°45.6'	19°54.6'	47°42.5'	51°43.1'	65°45.9'
10	169°35.4'	S 26°41.5'	1.1'	-2.3'	61.2'	79°36.5'	64°12.4'	53°32.3'	44°22.8'	20°32.1'	47°59.3'	52°01.3'	66°23.7'
11	183°55.4'	S 26°43.8'	1.0'	-2.1'	61.2'	79°15.3'	63°36.3'	52°54.3'	44°00.2'	21°09.7'	48°16.5'	52°19.7'	67°01.6'
12	198°15.4'	S 26°45.9'	1.0'	-1.9'	61.2'	78°54.2'	63°00.2'	52°16.3'	43°37.9'	21°47.3'	48°34.0'	52°38.4'	67°39.4'
13	212°35.4'	S 26°47.8'	0.9'	-1.7'	61.2'	78°33.1'	62°24.2'	51°38.4'	43°15.9'	22°24.9'	48°51.7'	52°57.4'	68°17.3'
14	226°55.3'	S 26°49.5'	0.9'	-1.5'	61.2'	78°12.1'	61°48.1'	51°00.4'	42°54.2'	23°02.6'	49°09.8'	53°16.6'	68°55.2'
15	241°15.2'	S 26°50.9'	0.9'	-1.2'	61.2'	77°51.2'	61°12.0'	50°22.3'	42°32.8'	23°40.3'	49°28.1'	53°36.1'	69°33.1'
16	255°35.1'	S 26°52.2'	0.8'	-1.0'	61.2'	77°30.3'	60°36.0'	49°44.3'	42°11.7'	24°18.1'	49°46.8'	53°55.8'	70°11.0'
17	269°54.9'	S 26°53.2'	0.8'	-0.8'	61.2'	77°09.4'	59°60.0'	49°06.3'	41°50.9'	24°55.8'	50°05.7'	54°15.7'	70°48.9'
18	284°14.7'	S 26°54.0'	0.8'	-0.6'	61.2'	76°48.7'	59°23.9'	48°28.2'	41°30.4'	25°33.6'	50°24.8'	54°35.8'	71°26.8'
19	298°34.5'	S 26°54.6'	0.8'	-0.4'	61.2'	76°27.9'	58°47.9'	47°50.2'	41°10.3'	26°11.5'	50°44.3'	54°56.2'	72°04.8'
20	312°54.2'	S 26°55.0'	0.7'	-0.2'	61.3'	76°07.3'	58°12.0'	47°12.1'	40°50.5'	26°49.3'	51°04.0'	55°16.8'	72°42.7'
21	327°14.0'	S 26°55.2'	0.7'	0.0'	61.3'	75°46.7'	57°36.0'	46°34.0'	40°31.1'	27°27.2'	51°23.9'	55°37.6'	73°20.7'
22	341°33.7'	S 26°55.1'	0.7'	0.3'	61.3'	75°26.2'	57°00.0'	45°56.0'	40°12.0'	28°05.0'	51°44.1'	55°58.6'	73°58.7'
23	355°53.4'	S 26°54.9'	0.7'	0.5'	61.3'	75°05.7'	56°24.1'	45°17.9'	39°53.3'	28°42.9'	52°04.6'	56°19.8'	74°36.7'
Mer. pass.		23 h 17 m SD 16.6'	phase 95%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.6'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.5'	Acrux	+0.8	173°02.5'	S 63°13.6'	Capella	+0.1	280°25.3'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.2'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°12.9'	N 89°21.2'
Rigil Kent	-0.0	139°42.9'	S 60°55.9'	Adhara	+1.5	255°07.9'	S 29°00.1'	Achernar	+0.5	335°21.8'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.8'				
Hadar	+0.6	148°38.7'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

h	Aries GHA	Sun GHA    dec		Venus GHA    dec		Jupiter GHA    dec		Saturn GHA    dec		Mars GHA    dec	
0	290°51.4'	178°33.8'	N 21°51.4'	207°27.3'	N 22°24.4'	282°41.6'	N 2°03.2'	323°59.4'	S 14°38.6'	257°09.8'	N 11°37.5'
1	305°53.9'	193°33.7'	N 21°51.0'	222°26.5'	N 22°24.6'	297°43.9'	N 2°03.2'	339°02.0'	S 14°38.7'	272°10.6'	N 11°38.1'
2	320°56.3'	208°33.6'	N 21°50.7'	237°25.8'	N 22°24.9'	312°46.3'	N 2°03.3'	354°04.6'	S 14°38.7'	287°11.4'	N 11°38.7'
3	335°58.8'	223°33.6'	N 21°50.3'	252°25.0'	N 22°25.1'	327°48.6'	N 2°03.3'	9°07.2'	S 14°38.8'	302°12.2'	N 11°39.3'
4	351°01.3'	238°33.5'	N 21°49.9'	267°24.2'	N 22°25.4'	342°51.0'	N 2°03.4'	24°09.8'	S 14°38.8'	317°13.1'	N 11°39.8'
5	6°03.7'	253°33.4'	N 21°49.6'	282°23.4'	N 22°25.6'	357°53.3'	N 2°03.4'	39°12.4'	S 14°38.9'	332°13.9'	N 11°40.4'
6	21°06.2'	268°33.3'	N 21°49.2'	297°22.6'	N 22°25.9'	12°55.7'	N 2°03.4'	54°15.0'	S 14°38.9'	347°14.7'	N 11°41.0'
7	36°08.7'	283°33.3'	N 21°48.9'	312°21.9'	N 22°26.1'	27°58.0'	N 2°03.5'	69°17.6'	S 14°39.0'	2°15.5'	N 11°41.6'
8	51°11.1'	298°33.2'	N 21°48.5'	327°21.1'	N 22°26.3'	43°00.3'	N 2°03.5'	84°20.1'	S 14°39.0'	17°16.3'	N 11°42.1'
9	66°13.6'	313°33.1'	N 21°48.1'	342°20.3'	N 22°26.6'	58°02.7'	N 2°03.6'	99°22.7'	S 14°39.1'	32°17.1'	N 11°42.7'
10	81°16.1'	328°33.1'	N 21°47.8'	357°19.5'	N 22°26.8'	73°05.0'	N 2°03.6'	114°25.3'	S 14°39.1'	47°17.9'	N 11°43.3'
11	96°18.5'	343°33.0'	N 21°47.4'	12°18.7'	N 22°27.0'	88°07.4'	N 2°03.6'	129°27.9'	S 14°39.2'	62°18.7'	N 11°43.9'
12	111°21.0'	358°32.9'	N 21°47.0'	27°18.0'	N 22°27.3'	103°09.7'	N 2°03.7'	144°30.5'	S 14°39.2'	77°19.6'	N 11°44.4'
13	126°23.5'	13°32.8'	N 21°46.7'	42°17.2'	N 22°27.5'	118°12.1'	N 2°03.7'	159°33.1'	S 14°39.3'	92°20.4'	N 11°45.0'
14	141°25.9'	28°32.8'	N 21°46.3'	57°16.4'	N 22°27.7'	133°14.4'	N 2°03.7'	174°35.7'	S 14°39.3'	107°21.2'	N 11°45.6'
15	156°28.4'	43°32.7'	N 21°45.9'	72°15.6'	N 22°27.9'	148°16.8'	N 2°03.8'	189°38.3'	S 14°39.4'	122°22.0'	N 11°46.2'
16	171°30.8'	58°32.6'	N 21°45.6'	87°14.8'	N 22°28.2'	163°19.1'	N 2°03.8'	204°40.9'	S 14°39.4'	137°22.8'	N 11°46.7'
17	186°33.3'	73°32.6'	N 21°45.2'	102°14.0'	N 22°28.4'	178°21.5'	N 2°03.8'	219°43.5'	S 14°39.5'	152°23.6'	N 11°47.3'
18	201°35.8'	88°32.5'	N 21°44.8'	117°13.3'	N 22°28.6'	193°23.8'	N 2°03.9'	234°46.1'	S 14°39.5'	167°24.4'	N 11°47.9'
19	216°38.2'	103°32.4'	N 21°44.4'	132°12.5'	N 22°28.9'	208°26.1'	N 2°03.9'	249°48.7'	S 14°39.6'	182°25.3'	N 11°48.5'
20	231°40.7'	118°32.3'	N 21°44.1'	147°11.7'	N 22°29.1'	223°28.5'	N 2°04.0'	264°51.3'	S 14°39.7'	197°26.1'	N 11°49.0'
21	246°43.2'	133°32.3'	N 21°43.7'	162°10.9'	N 22°29.3'	238°30.8'	N 2°04.0'	279°53.9'	S 14°39.7'	212°26.9'	N 11°49.6'
22	261°45.6'	148°32.2'	N 21°43.3'	177°10.1'	N 22°29.5'	253°33.2'	N 2°04.0'	294°56.5'	S 14°39.8'	227°27.7'	N 11°50.2'
23	276°48.1'	163°32.1'	N 21°43.0'	192°09.3'	N 22°29.7'	268°35.5'	N 2°04.1'	309°59.1'	S 14°39.8'	242°28.5'	N 11°50.7'
		SD 15.7' d -0.4'		v -0.8' d 0.2'		v 2.3' d 0.0'		v 2.6' d -0.1'		v 0.8' d 0.6'	
Mer. pass.		12 h 5 m 49 s		10 h 11 m		5 h 8 m		2 h 24 m		6 h 51 m	

h	Moon GHA    dec    v    d    HP					Lunar distance							
						-Achernar	-Fomalhaut	-Saturn	-Altair	+Antares	+Rigel Kent	+Hadar	+Acrux
0	10°13.1'	S 26°54.4'	0.7'	0.7'	61.3'	74°45.4'	55°48.2'	44°39.8'	39°35.0'	29°20.8'	52°25.3'	56°41.2'	67°46.5'
1	24°32.9'	S 26°53.7'	0.7'	0.9'	61.3'	74°25.1'	55°12.3'	44°01.7'	39°17.1'	29°58.8'	52°46.2'	57°02.8'	68°05.6'
2	38°52.6'	S 26°52.8'	0.7'	1.1'	61.3'	74°04.9'	54°36.5'	43°23.6'	38°59.5'	30°36.7'	53°07.3'	57°24.6'	68°24.8'
3	53°12.3'	S 26°51.7'	0.7'	1.3'	61.3'	73°44.8'	54°00.7'	42°45.5'	38°42.4'	31°14.7'	53°28.7'	57°46.6'	68°44.2'
4	67°32.0'	S 26°50.3'	0.7'	1.5'	61.3'	73°24.7'	53°24.9'	42°07.4'	38°25.7'	31°52.6'	53°50.3'	58°08.7'	69°03.6'
5	81°51.8'	S 26°48.8'	0.8'	1.8'	61.3'	73°04.8'	52°49.1'	41°29.3'	38°09.5'	32°30.6'	54°12.1'	58°31.1'	69°23.2'
6	96°11.6'	S 26°47.0'	0.8'	2.0'	61.3'	72°44.9'	52°13.4'	40°51.2'	37°53.7'	33°08.6'	54°34.1'	58°53.6'	69°42.9'
7	110°31.3'	S 26°45.1'	0.8'	2.2'	61.3'	72°25.2'	51°37.7'	40°13.1'		33°46.6'	54°56.3'	59°16.2'	70°02.8'
8	124°51.1'	S 26°42.9'	0.8'	2.4'	61.3'	72°05.5'	51°02.1'	39°35.0'		34°24.6'	55°18.7'	59°39.1'	70°22.7'
9	139°11.0'	S 26°40.5'	0.9'	2.6'	61.3'	71°46.0'	50°26.5'	38°57.0'		35°02.6'	55°41.3'	60°02.1'	70°42.8'
10	153°30.9'	S 26°37.8'	0.9'	2.8'	61.3'	71°26.5'	49°50.9'	38°18.9'		35°40.6'	56°04.1'	60°25.2'	71°02.9'
11	167°50.8'	S 26°35.0'	0.9'	3.0'	61.3'	71°07.2'	49°15.4'	37°40.8'		36°18.7'	56°27.0'	60°48.5'	71°23.2'
12	182°10.7'	S 26°32.0'	1.0'	3.2'	61.3'	70°47.9'	48°40.0'	37°02.7'		36°56.7'	56°50.2'	61°12.0'	71°43.5'
13	196°30.7'	S 26°28.7'	1.0'	3.5'	61.3'	70°28.8'	48°04.6'	36°24.7'		37°34.7'	57°13.5'	61°35.6'	72°04.0'
14	210°50.7'	S 26°25.3'	1.1'	3.7'	61.3'	70°09.8'	47°29.2'	35°46.6'		38°12.7'	57°37.0'	61°59.3'	72°24.6'
15	225°10.8'	S 26°21.6'	1.1'	3.9'	61.3'	69°50.9'	46°54.0'	35°08.6'		38°50.8'	58°00.6'	62°23.2'	72°45.2'
16	239°30.9'	S 26°17.7'	1.2'	4.1'	61.3'	69°32.1'	46°18.7'	34°30.6'		39°28.8'	58°24.5'	62°47.2'	73°06.0'
17	253°51.1'	S 26°13.7'	1.2'	4.3'	61.3'	69°13.4'	45°43.6'	33°52.6'		40°06.8'	58°48.4'	63°11.3'	73°26.8'
18	268°11.3'	S 26°09.4'	1.3'	4.5'	61.3'	68°54.9'	45°08.5'	33°14.6'		40°44.8'	59°12.5'	63°35.6'	73°47.7'
19	282°31.6'	S 26°04.9'	1.4'	4.7'	61.3'	68°36.5'	44°33.5'	32°36.6'		41°22.9'	59°36.8'	63°59.9'	74°08.7'
20	296°52.0'	S 26°00.2'	1.4'	4.9'	61.3'	68°18.2'	43°58.5'	31°58.6'		42°00.9'	60°01.2'	64°24.4'	74°29.8'
21	311°12.4'	S 25°55.3'	1.5'	5.1'	61.3'	68°00.1'	43°23.7'	31°20.7'		42°38.9'	60°25.8'	64°49.0'	74°51.0'
22	325°32.9'	S 25°50.2'	1.6'	5.3'	61.3'	67°42.1'	42°48.9'	30°42.7'		43°16.9'	60°50.4'	65°13.8'	75°12.2'
23	339°53.4'	S 25°44.9'	1.6'	5.5'	61.2'	67°24.2'	42°14.2'	30°04.8'		43°54.9'	61°15.2'	65°38.6'	75°33.5'
Mer. pass.		0 h 24 m SD 16.7' phase 99%											

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.6'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.5'	Acrux	+0.8	173°02.5'	S 63°13.6'	Capella	+0.1	280°25.3'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.2'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°12.3'	N 89°21.2'
Rigel Kent	-0.0	139°42.9'	S 60°55.9'	Adhara	+1.5	255°07.9'	S 29°00.1'	Achernar	+0.5	335°21.8'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.7'				
Hadar	+0.6	148°38.7'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

h	Aries	Sun		Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	291°50.6'	178°32.1'	N 21°42.6'	207°08.6'	N 22°30.0'	283°37.9'	N 2°04.1'	325°01.7'	S 14°39.9'	257°29.3'	N 11°51.3'
1	306°53.0'	193°32.0'	N 21°42.2'	222°07.8'	N 22°30.2'	298°40.2'	N 2°04.1'	340°04.3'	S 14°39.9'	272°30.1'	N 11°51.9'
2	321°55.5'	208°31.9'	N 21°41.8'	237°07.0'	N 22°30.4'	313°42.6'	N 2°04.2'	355°06.9'	S 14°40.0'	287°30.9'	N 11°52.5'
3	336°58.0'	223°31.9'	N 21°41.4'	252°06.2'	N 22°30.6'	328°44.9'	N 2°04.2'	10°09.5'	S 14°40.0'	302°31.8'	N 11°53.0'
4	352°00.4'	238°31.8'	N 21°41.1'	267°05.4'	N 22°30.8'	343°47.3'	N 2°04.2'	25°12.1'	S 14°40.1'	317°32.6'	N 11°53.6'
5	7°02.9'	253°31.7'	N 21°40.7'	282°04.6'	N 22°31.0'	358°49.6'	N 2°04.3'	40°14.7'	S 14°40.1'	332°33.4'	N 11°54.2'
6	22°05.3'	268°31.7'	N 21°40.3'	297°03.8'	N 22°31.2'	13°52.0'	N 2°04.3'	55°17.3'	S 14°40.2'	347°34.2'	N 11°54.7'
7	37°07.8'	283°31.6'	N 21°39.9'	312°03.1'	N 22°31.5'	28°54.3'	N 2°04.4'	70°19.9'	S 14°40.2'	2°35.0'	N 11°55.3'
8	52°10.3'	298°31.5'	N 21°39.6'	327°02.3'	N 22°31.7'	43°56.7'	N 2°04.4'	85°22.5'	S 14°40.3'	17°35.8'	N 11°55.9'
9	67°12.7'	313°31.5'	N 21°39.2'	342°01.5'	N 22°31.9'	58°59.0'	N 2°04.4'	100°25.1'	S 14°40.3'	32°36.6'	N 11°56.4'
10	82°15.2'	328°31.4'	N 21°38.8'	357°00.7'	N 22°32.1'	74°01.4'	N 2°04.5'	115°27.7'	S 14°40.4'	47°37.5'	N 11°57.0'
11	97°17.7'	343°31.3'	N 21°38.4'	11°59.9'	N 22°32.3'	89°03.7'	N 2°04.5'	130°30.3'	S 14°40.5'	62°38.3'	N 11°57.6'
12	112°20.1'	358°31.2'	N 21°38.0'	26°59.1'	N 22°32.5'	104°06.1'	N 2°04.5'	145°32.9'	S 14°40.5'	77°39.1'	N 11°58.2'
13	127°22.6'	13°31.2'	N 21°37.6'	41°58.3'	N 22°32.7'	119°08.5'	N 2°04.6'	160°35.5'	S 14°40.6'	92°39.9'	N 11°58.7'
14	142°25.1'	28°31.1'	N 21°37.3'	56°57.5'	N 22°32.9'	134°10.8'	N 2°04.6'	175°38.1'	S 14°40.6'	107°40.7'	N 11°59.3'
15	157°27.5'	43°31.1'	N 21°36.9'	71°56.8'	N 22°33.1'	149°13.2'	N 2°04.6'	190°40.7'	S 14°40.7'	122°41.5'	N 11°59.9'
16	172°30.0'	58°31.0'	N 21°36.5'	86°56.0'	N 22°33.3'	164°15.5'	N 2°04.7'	205°43.3'	S 14°40.7'	137°42.3'	N 12°00.4'
17	187°32.4'	73°30.9'	N 21°36.1'	101°55.2'	N 22°33.5'	179°17.9'	N 2°04.7'	220°45.9'	S 14°40.8'	152°43.2'	N 12°01.0'
18	202°34.9'	88°30.9'	N 21°35.7'	116°54.4'	N 22°33.7'	194°20.2'	N 2°04.7'	235°48.5'	S 14°40.8'	167°44.0'	N 12°01.6'
19	217°37.4'	103°30.8'	N 21°35.3'	131°53.6'	N 22°33.9'	209°22.6'	N 2°04.8'	250°51.1'	S 14°40.9'	182°44.8'	N 12°02.1'
20	232°39.8'	118°30.7'	N 21°34.9'	146°52.8'	N 22°34.1'	224°24.9'	N 2°04.8'	265°53.7'	S 14°40.9'	197°45.6'	N 12°02.7'
21	247°42.3'	133°30.7'	N 21°34.6'	161°52.0'	N 22°34.3'	239°27.3'	N 2°04.8'	280°56.3'	S 14°41.0'	212°46.4'	N 12°03.3'
22	262°44.8'	148°30.6'	N 21°34.2'	176°51.2'	N 22°34.5'	254°29.6'	N 2°04.9'	295°58.9'	S 14°41.0'	227°47.2'	N 12°03.8'
23	277°47.2'	163°30.5'	N 21°33.8'	191°50.4'	N 22°34.7'	269°32.0'	N 2°04.9'	311°01.6'	S 14°41.1'	242°48.1'	N 12°04.4'
		SD 15.7' d -0.4'		v -0.8' d 0.2'		v 2.4' d 0.0'		v 2.6' d -0.1'		v 0.8' d 0.6'	
Mer. pass.		12 h 5 m 56 s		10 h 12 m		5 h 5 m		2 h 20 m		6 h 50 m	

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Jupiter	-Achernar	-Fomalhaut	-Saturn	+Antares	+Rigel Kent	+Hadar	+AcruX
0	354°14.1'	S 25°39.4'	1.7'	5.7'	61.2'	73°31.7'	67°06.5'	41°39.6'	29°26.9'	44°32.9'	61°40.2'	66°03.5'	75°54.9'
1	8°34.8'	S 25°33.7'	1.8'	5.9'	61.2'	72°53.8'	66°48.9'	41°05.1'	28°49.1'	45°10.8'	62°05.2'	66°28.5'	76°16.3'
2	22°55.6'	S 25°27.8'	1.9'	6.1'	61.2'	72°15.8'	66°31.5'	40°30.7'	28°11.3'	45°48.8'	62°30.4'	66°53.7'	76°37.8'
3	37°16.5'	S 25°21.8'	2.0'	6.3'	61.2'	71°37.9'	66°14.2'	39°56.3'	27°33.4'	46°26.8'	62°55.7'	67°18.9'	76°59.4'
4	51°37.4'	S 25°15.5'	2.1'	6.5'	61.2'	71°00.0'	65°57.1'	39°22.1'	26°55.7'	47°04.7'	63°21.1'	67°44.2'	77°21.0'
5	65°58.5'	S 25°09.0'	2.1'	6.7'	61.2'	70°22.2'	65°40.2'	38°48.0'	26°17.9'	47°42.6'	63°46.6'	68°09.6'	77°42.7'
6	80°19.6'	S 25°02.4'	2.2'	6.8'	61.2'	69°44.3'	65°23.4'	38°14.1'	25°40.2'	48°20.6'	64°12.2'	68°35.0'	78°04.4'
7	94°40.8'	S 24°55.5'	2.3'	7.0'	61.2'	69°06.4'	65°06.7'	37°40.2'	25°02.6'	48°58.5'	64°37.9'	69°00.6'	78°26.2'
8	109°02.2'	S 24°48.5'	2.4'	7.2'	61.2'	68°28.6'	64°50.2'	37°06.5'	24°24.9'	49°36.4'	65°03.8'	69°26.2'	78°48.0'
9	123°23.6'	S 24°41.3'	2.5'	7.4'	61.1'	67°50.8'	64°33.9'	36°32.9'	23°47.3'	50°14.3'	65°29.7'	69°51.9'	79°09.9'
10	137°45.1'	S 24°33.9'	2.6'	7.6'	61.1'	67°13.0'	64°17.8'	35°59.4'	23°09.8'	50°52.1'	65°55.7'	70°17.7'	79°31.8'
11	152°06.8'	S 24°26.3'	2.7'	7.8'	61.1'	66°35.2'	64°01.8'	35°26.1'	22°32.3'	51°30.0'	66°21.7'	70°43.6'	79°53.8'
12	166°28.5'	S 24°18.6'	2.8'	7.9'	61.1'	65°57.5'	63°46.0'	34°53.0'	21°54.8'	52°07.8'	66°47.9'	71°09.5'	80°15.8'
13	180°50.3'	S 24°10.6'	2.9'	8.1'	61.1'	65°19.7'	63°30.4'	34°20.0'	21°17.4'	52°45.6'	67°14.1'	71°35.4'	80°37.8'
14	195°12.3'	S 24°02.5'	3.1'	8.3'	61.1'	64°42.0'	63°15.0'	33°47.2'	20°40.1'	53°23.4'	67°40.5'	72°01.5'	80°59.9'
15	209°34.3'	S 23°54.2'	3.2'	8.4'	61.0'	64°04.3'	62°59.8'	33°14.5'	20°02.8'	54°01.2'	68°06.9'	72°27.6'	81°22.0'
16	223°56.5'	S 23°45.8'	3.3'	8.6'	61.0'	63°26.6'	62°49.0'	32°42.0'	19°25.6'	54°38.9'	68°33.3'	72°53.7'	81°44.2'
17	238°18.8'	S 23°37.2'	3.4'	8.8'	61.0'	62°49.0'	62°35.2'	32°09.8'	18°48.4'	55°16.6'	68°59.9'	73°19.9'	82°06.3'
18	252°41.1'	S 23°28.4'	3.5'	9.0'	61.0'	62°11.3'	62°22.2'	31°37.7'	18°11.3'	55°54.3'	69°26.5'	73°46.2'	82°28.5'
19	267°03.6'	S 23°19.4'	3.6'	9.1'	61.0'	61°33.7'	62°09.8'	31°05.8'	17°34.3'	56°32.0'	69°53.1'	74°12.4'	82°50.7'
20	281°26.3'	S 23°10.3'	3.7'	9.3'	61.0'	60°56.1'	61°52.0'	30°34.2'	16°57.4'	57°09.7'	70°19.8'	74°38.8'	83°12.9'
21	295°49.0'	S 23°01.1'	3.9'	9.4'	60.9'	60°18.6'	61°39.7'	30°02.8'	16°20.6'	57°47.3'	70°46.6'	75°05.2'	83°35.2'
22	310°11.9'	S 22°51.6'	4.0'	9.6'	60.9'	59°41.1'	61°27.1'	29°31.6'	15°43.9'	58°24.9'	71°13.4'	75°31.6'	83°57.4'
23	324°34.8'	S 22°42.0'	4.1'	9.7'	60.9'	59°03.5'	61°14.6'	29°00.7'	15°07.3'	59°02.5'	71°40.3'	75°58.0'	84°19.7'
Mer. pass.													

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.6'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.5'	Acrux	+0.8	173°02.5'	S 63°13.6'	Capella	+0.1	280°25.3'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.2'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°11.8'	N 89°21.2'
Rigel Kent	-0.0	139°42.9'	S 60°55.9'	Adhara	+1.5	255°07.9'	S 29°00.1'	Achernar	+0.5	335°21.8'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.7'				
Hadar	+0.6	148°38.8'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

Friday 15 July 2022 UT1

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	292°49.7'	178°30.5'	N 21°33.4'	206°49.6'	N 22°34.9'	284°34.4'	N 2°04.9'	326°04.2'	S 14°41.1'	257°48.9'	N 12°05.0'			
1	307°52.2'	193°30.4'	N 21°33.0'	221°48.8'	N 22°35.1'	299°36.7'	N 2°05.0'	341°06.8'	S 14°41.2'	272°49.7'	N 12°05.5'			
2	322°54.6'	208°30.3'	N 21°32.6'	236°48.1'	N 22°35.3'	314°39.1'	N 2°05.0'	356°09.4'	S 14°41.3'	287°50.5'	N 12°06.1'			
3	337°57.1'	223°30.3'	N 21°32.2'	251°47.3'	N 22°35.5'	329°41.4'	N 2°05.0'	11°12.0'	S 14°41.3'	302°51.3'	N 12°06.7'			
4	352°59.6'	238°30.2'	N 21°31.8'	266°46.5'	N 22°35.6'	344°43.8'	N 2°05.1'	26°14.6'	S 14°41.4'	317°52.1'	N 12°07.2'			
5	8°02.0'	253°30.1'	N 21°31.4'	281°45.7'	N 22°35.8'	359°46.1'	N 2°05.1'	41°17.2'	S 14°41.4'	332°52.9'	N 12°07.8'			
6	23°04.5'	268°30.1'	N 21°31.0'	296°44.9'	N 22°36.0'	14°48.5'	N 2°05.1'	56°19.8'	S 14°41.5'	347°53.8'	N 12°08.4'			
7	38°06.9'	283°30.0'	N 21°30.6'	311°44.1'	N 22°36.2'	29°50.9'	N 2°05.2'	71°22.4'	S 14°41.5'	2°54.6'	N 12°08.9'			
8	53°09.4'	298°30.0'	N 21°30.2'	326°43.3'	N 22°36.4'	44°53.2'	N 2°05.2'	86°25.0'	S 14°41.6'	17°55.4'	N 12°09.5'			
9	68°11.9'	313°29.9'	N 21°29.9'	341°42.5'	N 22°36.6'	59°55.6'	N 2°05.2'	101°27.6'	S 14°41.6'	32°56.2'	N 12°10.1'			
10	83°14.3'	328°29.8'	N 21°29.5'	356°41.7'	N 22°36.8'	74°57.9'	N 2°05.3'	116°30.2'	S 14°41.7'	47°57.0'	N 12°10.6'			
11	98°16.8'	343°29.8'	N 21°29.1'	11°40.9'	N 22°36.9'	90°00.3'	N 2°05.3'	131°32.8'	S 14°41.7'	62°57.8'	N 12°11.2'			
12	113°19.3'	358°29.7'	N 21°28.7'	26°40.1'	N 22°37.1'	105°02.7'	N 2°05.3'	146°35.4'	S 14°41.8'	77°58.7'	N 12°11.7'			
13	128°21.7'	13°29.7'	N 21°28.3'	41°39.3'	N 22°37.3'	120°05.0'	N 2°05.3'	161°38.0'	S 14°41.9'	92°59.5'	N 12°12.3'			
14	143°24.2'	28°29.6'	N 21°27.9'	56°38.5'	N 22°37.5'	135°07.4'	N 2°05.4'	176°40.6'	S 14°41.9'	108°00.3'	N 12°12.9'			
15	158°26.7'	43°29.5'	N 21°27.5'	71°37.8'	N 22°37.6'	150°09.7'	N 2°05.4'	191°43.2'	S 14°42.0'	123°01.1'	N 12°13.4'			
16	173°29.1'	58°29.5'	N 21°27.1'	86°37.0'	N 22°37.8'	165°12.1'	N 2°05.4'	206°45.8'	S 14°42.0'	138°01.9'	N 12°14.0'			
17	188°31.6'	73°29.4'	N 21°26.7'	101°36.2'	N 22°38.0'	180°14.5'	N 2°05.5'	221°48.4'	S 14°42.1'	153°02.7'	N 12°14.6'			
18	203°34.1'	88°29.3'	N 21°26.3'	116°35.4'	N 22°38.2'	195°16.8'	N 2°05.5'	236°51.0'	S 14°42.1'	168°03.6'	N 12°15.1'			
19	218°36.5'	103°29.3'	N 21°25.9'	131°34.6'	N 22°38.3'	210°19.2'	N 2°05.5'	251°53.6'	S 14°42.2'	183°04.4'	N 12°15.7'			
20	233°39.0'	118°29.2'	N 21°25.5'	146°33.8'	N 22°38.5'	225°21.5'	N 2°05.6'	266°56.2'	S 14°42.2'	198°05.2'	N 12°16.2'			
21	248°41.4'	133°29.2'	N 21°25.1'	161°33.0'	N 22°38.7'	240°23.9'	N 2°05.6'	281°58.8'	S 14°42.3'	213°06.0'	N 12°16.8'			
22	263°43.9'	148°29.1'	N 21°24.6'	176°32.2'	N 22°38.8'	255°26.3'	N 2°05.6'	297°01.4'	S 14°42.3'	228°06.8'	N 12°17.4'			
23	278°46.4'	163°29.0'	N 21°24.2'	191°31.4'	N 22°39.0'	270°28.6'	N 2°05.7'	312°04.0'	S 14°42.4'	243°07.6'	N 12°17.9'			
		SD 15.7' d -0.4'		v -0.8' d 0.2'		v 2.4' d 0.0'		v 2.6' d -0.1'		v 0.8' d 0.6'				
Mer. pass.	12 h 6 m 2 s			10 h 13 m		5 h 1 m		2 h 15 m		6 h 48 m				

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Mars	-Jupiter	-Fomalhaut	-Saturn	+Altair	+Antares	+Rigel Kent	+Hadar
0	338°57.9'	S 22°32.3'	4.2'	9.9'	60.9'	86°38.1'	58°26.1'	28°30.1'	14°30.8'		59°40.1'	72°07.2'	76°24.5'
1	353°21.2'	S 22°22.4'	4.3'	10.0'	60.9'	86°02.2'	57°48.6'	27°59.7'	13°54.5'		60°17.6'	72°34.2'	76°51.0'
2	7°44.5'	S 22°12.3'	4.5'	10.2'	60.8'	85°26.3'	57°11.2'	27°29.7'	13°18.3'		60°55.1'	73°01.2'	77°17.6'
3	22°08.0'	S 22°02.2'	4.6'	10.3'	60.8'	84°50.5'	56°33.8'	26°59.9'	12°42.3'		61°32.6'	73°28.3'	77°44.1'
4	36°31.6'	S 21°51.8'	4.7'	10.5'	60.8'	84°14.7'	55°56.4'	26°30.5'	12°06.5'		62°10.0'	73°55.3'	78°10.7'
5	50°55.3'	S 21°41.3'	4.8'	10.6'	60.8'	83°38.9'	55°19.1'	26°01.4'	11°31.0'		62°47.4'	74°22.5'	78°37.3'
6	65°19.1'	S 21°30.7'	5.0'	10.8'	60.7'	83°03.2'	54°41.8'	25°32.7'	10°55.6'		63°24.8'	74°49.6'	79°03.9'
7	79°43.1'	S 21°19.9'	5.1'	10.9'	60.7'	82°27.5'	54°04.5'	25°04.4'	10°20.6'		64°02.2'	75°16.8'	79°30.6'
8	94°07.2'	S 21°09.0'	5.2'	11.0'	60.7'	81°51.8'	53°27.3'	24°36.5'	9°45.9'		64°39.5'	75°44.0'	79°57.3'
9	108°31.4'	S 20°58.0'	5.4'	11.2'	60.7'	81°16.2'	52°50.1'	24°09.0'	9°11.6'		65°16.8'	76°11.3'	80°23.9'
10	122°55.8'	S 20°46.8'	5.5'	11.3'	60.6'	80°40.6'	52°12.9'	23°41.9'	8°37.7'		65°54.0'	76°38.5'	80°50.6'
11	137°20.3'	S 20°35.6'	5.6'	11.4'	60.6'	80°05.0'	51°35.8'	23°15.3'	8°04.5'		66°31.3'	77°05.8'	81°17.3'
12	151°44.9'	S 20°24.1'	5.7'	11.5'	60.6'	79°29.4'	50°58.7'	22°49.2'			67°08.5'	77°33.1'	81°44.0'
13	166°09.6'	S 20°12.6'	5.9'	11.7'	60.6'	78°53.9'	50°21.6'	22°23.7'			67°45.6'	78°00.4'	82°10.7'
14	180°34.5'	S 20°00.9'	6.0'	11.8'	60.5'	78°18.5'	49°44.6'	21°58.6'		37°53.8'	68°22.7'	78°27.7'	82°37.4'
15	194°59.5'	S 19°49.1'	6.1'	11.9'	60.5'	77°43.0'	49°07.6'	21°34.2'		38°09.2'	68°59.8'	78°55.1'	83°04.1'
16	209°24.7'	S 19°37.2'	6.3'	12.0'	60.5'	77°07.6'	48°30.6'	21°10.4'		38°25.0'	69°36.9'	79°22.4'	83°30.8'
17	223°49.9'	S 19°25.2'	6.4'	12.1'	60.4'	76°32.3'	47°53.7'	20°47.2'		38°41.2'	70°13.9'	79°49.8'	83°57.5'
18	238°15.3'	S 19°13.0'	6.5'	12.3'	60.4'	75°56.9'	47°16.8'	20°24.6'		38°57.7'	70°50.9'	80°17.1'	84°24.2'
19	252°40.8'	S 19°00.8'	6.7'	12.4'	60.4'	75°21.6'	46°40.0'	20°02.8'		39°14.7'	71°27.8'	80°44.5'	84°50.9'
20	267°06.5'	S 18°48.4'	6.8'	12.5'	60.4'	74°46.4'	46°03.2'	19°41.8'		39°32.0'	72°04.7'	81°11.8'	85°17.5'
21	281°32.3'	S 18°36.0'	6.9'	12.6'	60.3'	74°11.2'	45°26.4'			39°49.7'	72°41.6'	81°39.2'	85°44.2'
22	295°58.2'	S 18°23.4'	7.0'	12.7'	60.3'	73°36.0'	44°49.7'			40°07.7'	73°18.4'	82°06.6'	86°10.8'
23	310°24.2'	S 18°10.7'	7.2'	12.8'	60.3'	73°00.9'	44°13.0'			40°26.0'	73°55.2'	82°33.9'	86°37.5'
Mer. pass.	1 h 28 m SD 16.6' phase 98%												

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.4'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.5'	Acrux	+0.8	173°02.5'	S 63°13.6'	Capella	+0.1	280°25.3'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.2'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°11.3'	N 89°21.2'
Rigel Kent	-0.0	139°42.9'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.1'	Achernar	+0.5	335°21.8'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.7'				
Hadar	+0.6	148°38.8'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

Saturday 16 July 2022 UT1

h	Aries	Sun		Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	293°48.8'	178°29.0'	N 21°23.8'	206°30.6'	N 22°39.2'	285°31.0'	N 2°05.7'	327°06.6'	S 14°42.5'	258°08.5'	N 12°18.5'
1	308°51.3'	193°28.9'	N 21°23.4'	221°29.8'	N 22°39.3'	300°33.4'	N 2°05.7'	342°09.2'	S 14°42.5'	273°09.3'	N 12°19.1'
2	323°53.8'	208°28.9'	N 21°23.0'	236°29.0'	N 22°39.5'	315°35.7'	N 2°05.7'	357°11.9'	S 14°42.6'	288°10.1'	N 12°19.6'
3	338°56.2'	223°28.8'	N 21°22.6'	251°28.2'	N 22°39.7'	330°38.1'	N 2°05.8'	12°14.5'	S 14°42.6'	303°10.9'	N 12°20.2'
4	353°58.7'	238°28.8'	N 21°22.2'	266°27.4'	N 22°39.8'	345°40.4'	N 2°05.8'	27°17.1'	S 14°42.7'	318°11.7'	N 12°20.7'
5	9°01.2'	253°28.7'	N 21°21.8'	281°26.6'	N 22°40.0'	0°42.8'	N 2°05.8'	42°19.7'	S 14°42.7'	333°12.5'	N 12°21.3'
6	24°03.6'	268°28.6'	N 21°21.4'	296°25.8'	N 22°40.2'	15°45.2'	N 2°05.9'	57°22.3'	S 14°42.8'	348°13.4'	N 12°21.9'
7	39°06.1'	283°28.6'	N 21°21.0'	311°25.0'	N 22°40.3'	30°47.5'	N 2°05.9'	72°24.9'	S 14°42.8'	3°14.2'	N 12°22.4'
8	54°08.6'	298°28.5'	N 21°20.6'	326°24.2'	N 22°40.5'	45°49.9'	N 2°05.9'	87°27.5'	S 14°42.9'	18°15.0'	N 12°23.0'
9	69°11.0'	313°28.5'	N 21°20.2'	341°23.4'	N 22°40.6'	60°52.3'	N 2°05.9'	102°30.1'	S 14°42.9'	33°15.8'	N 12°23.5'
10	84°13.5'	328°28.4'	N 21°19.7'	356°22.6'	N 22°40.8'	75°54.6'	N 2°06.0'	117°32.7'	S 14°43.0'	48°16.6'	N 12°24.1'
11	99°15.9'	343°28.4'	N 21°19.3'	11°21.8'	N 22°40.9'	90°57.0'	N 2°06.0'	132°35.3'	S 14°43.1'	63°17.5'	N 12°24.6'
12	114°18.4'	358°28.3'	N 21°18.9'	26°21.0'	N 22°41.1'	105°59.4'	N 2°06.0'	147°37.9'	S 14°43.1'	78°18.3'	N 12°25.2'
13	129°20.9'	13°28.2'	N 21°18.5'	41°20.2'	N 22°41.2'	121°01.7'	N 2°06.1'	162°40.5'	S 14°43.2'	93°19.1'	N 12°25.8'
14	144°23.3'	28°28.2'	N 21°18.1'	56°19.4'	N 22°41.4'	136°04.1'	N 2°06.1'	177°43.1'	S 14°43.2'	108°19.9'	N 12°26.3'
15	159°25.8'	43°28.1'	N 21°17.7'	71°18.6'	N 22°41.5'	151°06.5'	N 2°06.1'	192°45.7'	S 14°43.3'	123°20.7'	N 12°26.9'
16	174°28.3'	58°28.1'	N 21°17.3'	86°17.8'	N 22°41.7'	166°08.8'	N 2°06.1'	207°48.3'	S 14°43.3'	138°21.5'	N 12°27.4'
17	189°30.7'	73°28.0'	N 21°16.9'	101°17.0'	N 22°41.8'	181°11.2'	N 2°06.2'	222°50.9'	S 14°43.4'	153°22.4'	N 12°28.0'
18	204°33.2'	88°28.0'	N 21°16.4'	116°16.2'	N 22°42.0'	196°13.6'	N 2°06.2'	237°53.5'	S 14°43.4'	168°23.2'	N 12°28.6'
19	219°35.7'	103°27.9'	N 21°16.0'	131°15.4'	N 22°42.1'	211°16.0'	N 2°06.2'	252°56.2'	S 14°43.5'	183°24.0'	N 12°29.1'
20	234°38.1'	118°27.9'	N 21°15.6'	146°14.6'	N 22°42.3'	226°18.3'	N 2°06.3'	267°58.8'	S 14°43.5'	198°24.8'	N 12°29.7'
21	249°40.6'	133°27.8'	N 21°15.2'	161°13.8'	N 22°42.4'	241°20.7'	N 2°06.3'	283°01.4'	S 14°43.6'	213°25.6'	N 12°30.2'
22	264°43.0'	148°27.7'	N 21°14.8'	176°13.0'	N 22°42.6'	256°23.1'	N 2°06.3'	298°04.0'	S 14°43.7'	228°26.5'	N 12°30.8'
23	279°45.5'	163°27.7'	N 21°14.3'	191°12.2'	N 22°42.7'	271°25.4'	N 2°06.3'	313°06.6'	S 14°43.7'	243°27.3'	N 12°31.3'
		SD 15.7' <i>d</i> -0.4'		<i>v</i> -0.8' <i>d</i> 0.2'		<i>v</i> 2.4' <i>d</i> 0.0'		<i>v</i> 2.6' <i>d</i> -0.1'		<i>v</i> 0.8' <i>d</i> 0.6'	
Mer. pass.		12 h 6 m 8 s		10 h 15 m		4 h 57 m		2 h 11 m		6 h 47 m	

h	Moon					Lunar distance							
	GHA	dec	<i>v</i>	<i>d</i>	HP	-Rigel	-Aldebaran	-Mars	-Jupiter	+Saturn	+Altair	+Antares	+Rigel Kent
0	324°50.4'	S 17°57.9'	7.3'	12.9'	60.2'	106°04.9'	104°33.1'	72°25.8'	43°36.4'		40°44.7'	74°31.9'	83°01.3'
1	339°16.7'	S 17°45.1'	7.4'	13.0'	60.2'	105°34.7'	103°56.7'	71°50.7'	42°59.8'		41°03.7'	75°08.6'	83°28.6'
2	353°43.1'	S 17°32.1'	7.6'	13.1'	60.2'	105°04.5'	103°20.3'	71°15.7'	42°23.2'		41°23.0'	75°45.3'	83°55.9'
3	8°09.7'	S 17°19.0'	7.7'	13.2'	60.1'	104°34.3'	102°43.9'	70°40.8'	41°46.7'		41°42.6'	76°21.9'	84°23.3'
4	22°36.3'	S 17°05.9'	7.8'	13.2'	60.1'	104°04.2'	102°07.6'	70°05.8'	41°10.2'		42°02.5'	76°58.5'	84°50.6'
5	37°03.1'	S 16°52.6'	7.9'	13.3'	60.1'	103°34.0'	101°31.3'	69°30.9'	40°33.8'		42°22.6'	77°35.1'	85°17.9'
6	51°30.1'	S 16°39.3'	8.1'	13.4'	60.0'	103°03.8'	100°55.1'	68°56.1'	39°57.4'		42°43.1'	78°11.5'	85°45.1'
7	65°57.1'	S 16°25.9'	8.2'	13.5'	60.0'	102°33.6'	100°18.8'	68°21.3'	39°21.0'		43°03.8'	78°48.0'	86°12.4'
8	80°24.3'	S 16°12.4'	8.3'	13.6'	60.0'	102°03.5'	99°42.7'	67°46.5'	38°44.7'		43°24.7'	79°24.4'	86°39.6'
9	94°51.6'	S 15°58.8'	8.4'	13.7'	59.9'	101°33.3'	99°06.6'	67°11.8'	38°08.5'	7°28.6'	43°45.9'	80°00.8'	87°06.8'
10	109°19.0'	S 15°45.1'	8.5'	13.7'	59.9'	101°03.2'	98°30.5'	66°37.2'	37°32.3'	8°00.3'	44°07.4'	80°37.1'	87°34.0'
11	123°46.6'	S 15°31.4'	8.7'	13.8'	59.9'	100°33.1'	97°54.4'	66°02.5'	36°56.1'	8°32.7'	44°29.0'	81°13.4'	88°01.2'
12	138°14.2'	S 15°17.6'	8.8'	13.9'	59.8'	100°02.9'	97°18.4'	65°27.9'	36°20.0'	9°05.5'	44°50.9'	81°49.6'	88°28.3'
13	152°42.0'	S 15°03.7'	8.9'	14.0'	59.8'	99°32.8'	96°42.5'	64°53.4'	35°43.9'	9°38.7'	45°13.0'	82°25.8'	88°55.4'
14	167°09.9'	S 14°49.8'	9.0'	14.0'	59.8'	99°02.8'	96°06.6'	64°18.9'	35°07.9'	10°12.3'	45°35.3'	83°02.0'	89°22.5'
15	181°37.9'	S 14°35.7'	9.1'	14.1'	59.7'	98°32.7'	95°30.7'	63°44.5'	34°31.9'	10°46.0'	45°57.8'	83°38.1'	89°49.5'
16	196°06.1'	S 14°21.6'	9.3'	14.2'	59.7'	98°02.7'	94°54.9'	63°10.1'	33°56.0'	11°20.0'	46°20.5'	84°14.1'	90°16.5'
17	210°34.3'	S 14°07.5'	9.4'	14.2'	59.7'	97°32.7'	94°19.1'	62°35.7'	33°20.1'	11°54.2'	46°43.4'	84°50.1'	90°43.5'
18	225°02.7'	S 13°53.3'	9.5'	14.3'	59.6'	97°02.7'	93°43.4'	62°01.4'	32°44.2'	12°28.5'	47°06.5'	85°26.1'	91°10.4'
19	239°31.2'	S 13°39.0'	9.6'	14.3'	59.6'	96°32.7'	93°07.7'	61°27.1'	32°08.5'	13°03.0'	47°29.8'	86°02.0'	91°37.3'
20	253°59.8'	S 13°24.7'	9.7'	14.4'	59.5'	96°02.8'	92°32.1'	60°52.9'	31°32.7'	13°37.5'	47°53.2'	86°37.9'	92°04.2'
21	268°28.5'	S 13°10.3'	9.8'	14.4'	59.5'	95°32.9'	91°56.5'	60°18.8'	30°57.0'	14°12.1'	48°16.8'	87°13.7'	92°31.0'
22	282°57.3'	S 12°55.8'	9.9'	14.5'	59.5'	95°03.0'	91°21.0'	59°44.6'	30°21.4'	14°46.8'	48°40.5'	87°49.5'	92°57.8'
23	297°26.2'	S 12°41.3'	10.0'	14.5'	59.4'	94°33.1'	90°45.5'	59°10.6'	29°45.8'	15°21.5'	49°04.4'	88°25.2'	93°24.5'
Mer. pass.		2 h 26 m SD 16.4'	phase 92%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.5'	Acrux	+0.8	173°02.5'	S 63°13.6'	Capella	+0.1	280°25.3'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	N 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.2'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°10.9'	N 89°21.2'
Rigel Kent	-0.0	139°42.9'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.1'	Achernar	+0.5	335°21.8'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.7'				
Hadar	+0.6	148°38.8'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				



h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	294°48.0'	178°27.6'	N 21°13.9'	206°11.4'	N 22°42.8'	286°27.8'	N 2°06.4'	328°09.2'	S 14°43.8'	258°28.1'	N 12°31.9'	
1	309°50.4'	193°27.6'	N 21°13.5'	221°10.6'	N 22°43.0'	301°30.2'	N 2°06.4'	343°11.8'	S 14°43.8'	273°28.9'	N 12°32.4'	
2	324°52.9'	208°27.5'	N 21°13.1'	236°09.8'	N 22°43.1'	316°32.5'	N 2°06.4'	358°14.4'	S 14°43.9'	288°29.7'	N 12°33.0'	
3	339°55.4'	223°27.5'	N 21°12.7'	251°09.0'	N 22°43.3'	331°34.9'	N 2°06.4'	13°17.0'	S 14°43.9'	303°30.5'	N 12°33.6'	
4	354°57.8'	238°27.4'	N 21°12.2'	266°08.2'	N 22°43.4'	346°37.3'	N 2°06.5'	28°19.6'	S 14°44.0'	318°31.4'	N 12°34.1'	
5	10°00.3'	253°27.4'	N 21°11.8'	281°07.4'	N 22°43.5'	1°39.7'	N 2°06.5'	43°22.2'	S 14°44.0'	333°32.2'	N 12°34.7'	
6	25°02.8'	268°27.3'	N 21°11.4'	296°06.6'	N 22°43.7'	16°42.0'	N 2°06.5'	58°24.8'	S 14°44.1'	348°33.0'	N 12°35.2'	
7	40°05.2'	283°27.3'	N 21°11.0'	311°05.8'	N 22°43.8'	31°44.4'	N 2°06.5'	73°27.4'	S 14°44.2'	3°33.8'	N 12°35.8'	
8	55°07.7'	298°27.2'	N 21°10.5'	326°05.0'	N 22°43.9'	46°46.8'	N 2°06.6'	88°30.1'	S 14°44.2'	18°34.6'	N 12°36.3'	
9	70°10.2'	313°27.2'	N 21°10.1'	341°04.2'	N 22°44.0'	61°49.1'	N 2°06.6'	103°32.7'	S 14°44.3'	33°35.5'	N 12°36.9'	
10	85°12.6'	328°27.1'	N 21°09.7'	356°03.4'	N 22°44.2'	76°51.5'	N 2°06.6'	118°35.3'	S 14°44.3'	48°36.3'	N 12°37.4'	
11	100°15.1'	343°27.1'	N 21°09.3'	11°02.6'	N 22°44.3'	91°53.9'	N 2°06.6'	133°37.9'	S 14°44.4'	63°37.1'	N 12°38.0'	
12	115°17.5'	358°27.0'	N 21°08.8'	26°01.8'	N 22°44.4'	106°56.3'	N 2°06.7'	148°40.5'	S 14°44.4'	78°37.9'	N 12°38.5'	
13	130°20.0'	13°27.0'	N 21°08.4'	41°01.0'	N 22°44.6'	121°58.6'	N 2°06.7'	163°43.1'	S 14°44.5'	93°38.7'	N 12°39.1'	
14	145°22.5'	28°26.9'	N 21°08.0'	56°00.2'	N 22°44.7'	137°01.0'	N 2°06.7'	178°45.7'	S 14°44.5'	108°39.6'	N 12°39.6'	
15	160°24.9'	43°26.9'	N 21°07.5'	70°59.4'	N 22°44.8'	152°03.4'	N 2°06.7'	193°48.3'	S 14°44.6'	123°40.4'	N 12°40.2'	
16	175°27.4'	58°26.8'	N 21°07.1'	85°58.6'	N 22°44.9'	167°05.8'	N 2°06.8'	208°50.9'	S 14°44.7'	138°41.2'	N 12°40.7'	
17	190°29.9'	73°26.8'	N 21°06.7'	100°57.8'	N 22°45.0'	182°08.1'	N 2°06.8'	223°53.5'	S 14°44.7'	153°42.0'	N 12°41.3'	
18	205°32.3'	88°26.7'	N 21°06.2'	115°57.0'	N 22°45.2'	197°10.5'	N 2°06.8'	238°56.1'	S 14°44.8'	168°42.8'	N 12°41.8'	
19	220°34.8'	103°26.7'	N 21°05.8'	130°56.2'	N 22°45.3'	212°12.9'	N 2°06.8'	253°58.8'	S 14°44.8'	183°43.7'	N 12°42.4'	
20	235°37.3'	118°26.6'	N 21°05.4'	145°55.4'	N 22°45.4'	227°15.3'	N 2°06.9'	269°01.4'	S 14°44.9'	198°44.5'	N 12°42.9'	
21	250°39.7'	133°26.6'	N 21°04.9'	160°54.6'	N 22°45.5'	242°17.6'	N 2°06.9'	284°04.0'	S 14°44.9'	213°45.3'	N 12°43.5'	
22	265°42.2'	148°26.5'	N 21°04.5'	175°53.8'	N 22°45.6'	257°20.0'	N 2°06.9'	299°06.6'	S 14°45.0'	228°46.1'	N 12°44.0'	
23	280°44.7'	163°26.5'	N 21°04.1'	190°52.9'	N 22°45.8'	272°22.4'	N 2°06.9'	314°09.2'	S 14°45.1'	243°46.9'	N 12°44.6'	
		SD 15.7' d -0.4'		v -0.8' d 0.1'		v 2.4' d 0.0'		v 2.6' d -0.1'		v 0.8' d 0.6'		
Mer. pass.		12 h 6 m 13 s		10 h 16 m		4 h 53 m		2 h 7 m		6 h 46 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Rigel	-Aldebaran	-Mars	-Jupiter	+Saturn	+Fomalhaut	+Altair	+Antares
0	311°55.2'	S 12°26.8'	10.1'	14.6'	59.4'	94°03.3'	90°10.0'	58°36.5'	29°10.3'	15°56.3'		49°28.4'	89°00.9'
1	326°24.4'	S 12°12.2'	10.2'	14.6'	59.4'	93°33.5'	89°34.6'	58°02.6'	28°34.8'	16°31.1'		49°52.6'	89°36.5'
2	340°53.6'	S 11°57.5'	10.4'	14.7'	59.3'	93°03.7'	88°59.3'	57°28.6'	27°59.3'	17°05.9'		50°16.9'	90°12.1'
3	355°23.0'	S 11°42.9'	10.5'	14.7'	59.3'	92°34.0'	88°24.0'	56°54.7'	27°23.9'	17°40.8'		50°41.4'	90°47.7'
4	9°52.4'	S 11°28.1'	10.6'	14.8'	59.2'	92°04.3'	87°48.7'	56°20.9'	26°48.6'	18°15.6'		51°05.9'	91°23.1'
5	24°22.0'	S 11°13.3'	10.7'	14.8'	59.2'	91°34.7'	87°13.5'	55°47.1'	26°13.3'	18°50.5'		51°30.6'	91°58.6'
6	38°51.7'	S 10°58.5'	10.8'	14.9'	59.2'	91°05.1'	86°38.4'	55°13.4'	25°38.1'	19°25.3'		51°55.4'	92°34.0'
7	53°21.4'	S 10°43.7'	10.9'	14.9'	59.1'	90°35.5'	86°03.3'	54°39.7'	25°02.9'	20°00.1'	18°52.0'	52°20.3'	93°09.3'
8	67°51.3'	S 10°28.8'	11.0'	14.9'	59.1'	90°06.0'	85°28.2'	54°06.0'	24°27.8'	20°35.0'	19°10.2'	52°45.3'	93°44.6'
9	82°21.2'	S 10°13.9'	11.1'	15.0'	59.1'	89°36.5'	84°53.2'	53°32.5'	23°52.7'	21°09.8'	19°29.1'	53°10.4'	94°19.9'
10	96°51.3'	S 9°58.9'	11.1'	15.0'	59.0'	89°07.0'	84°18.2'	52°58.9'	23°17.7'	21°44.6'	19°48.7'	53°35.7'	94°55.1'
11	111°21.4'	S 9°43.9'	11.2'	15.0'	59.0'	88°37.6'	83°43.3'	52°25.4'	22°42.7'	22°19.4'	20°09.0'	54°01.0'	95°30.2'
12	125°51.7'	S 9°28.9'	11.3'	15.0'	58.9'	88°08.2'	83°08.4'	51°52.0'	22°07.8'	22°54.1'	20°29.9'	54°26.4'	96°05.3'
13	140°22.0'	S 9°13.9'	11.4'	15.1'	58.9'	87°38.9'	82°33.6'	51°18.6'	21°33.0'	23°28.9'	20°51.4'	54°51.8'	96°40.4'
14	154°52.4'	S 8°58.8'	11.5'	15.1'	58.9'	87°09.6'	81°58.9'	50°45.2'	20°58.2'	24°03.6'	21°13.4'	55°17.4'	97°15.4'
15	169°22.9'	S 8°43.7'	11.6'	15.1'	58.8'	86°40.4'	81°24.1'	50°11.9'	20°23.4'	24°38.3'	21°35.9'	55°43.1'	97°50.3'
16	183°53.5'	S 8°28.6'	11.7'	15.1'	58.8'	86°11.2'	80°49.5'	49°38.7'	19°48.8'	25°12.9'	21°59.0'	56°08.8'	98°25.2'
17	198°24.2'	S 8°13.4'	11.8'	15.2'	58.7'	85°42.1'	80°14.9'	49°05.5'	19°14.2'	25°47.6'	22°22.4'	56°34.6'	99°00.1'
18	212°55.0'	S 7°58.3'	11.9'	15.2'	58.7'	85°13.0'	79°40.3'	48°32.3'	18°39.6'	26°22.2'	22°46.3'	57°00.4'	99°34.9'
19	227°25.9'	S 7°43.1'	11.9'	15.2'	58.7'	84°44.0'	79°05.8'	47°59.2'	18°05.1'	26°56.7'	23°10.7'	57°26.4'	100°09.6'
20	241°56.8'	S 7°27.9'	12.0'	15.2'	58.6'	84°15.0'	78°31.3'	47°26.2'	17°30.7'	27°31.2'	23°35.3'	57°52.4'	100°44.3'
21	256°27.8'	S 7°12.7'	12.1'	15.2'	58.6'	83°46.1'	77°56.9'	46°53.2'	16°56.3'	28°05.7'	24°00.4'	58°18.4'	101°19.0'
22	270°58.9'	S 6°57.4'	12.2'	15.2'	58.5'	83°17.2'	77°22.6'	46°20.2'	16°22.0'	28°40.2'	24°25.8'	58°44.5'	101°53.6'
23	285°30.1'	S 6°42.2'	12.3'	15.3'	58.5'	82°48.4'	76°48.2'	45°47.3'	15°47.8'	29°14.6'	24°51.5'	59°10.7'	102°28.1'
Mer. pass.		3 h 19 m SD 16.2'		phase 85%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.5'	Acrux	+0.8	173°02.5'	S 63°13.6'	Capella	+0.1	280°25.3'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.2'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°10.5'	N 89°21.2'
Rigil Kent	-0.0	139°42.9'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.1'	Achernar	+0.5	335°21.8'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.7'				
Hadar	+0.6	148°38.8'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

Monday 18 July 2022 UT1

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	295°47.1'	178°26.4'	N 21°03.6'	205°52.1'	N 22°45.9'	287°24.8'	N 2°07.0'	329°11.8'	S 14°45.1'	258°47.8'	N 12°45.1'			
1	310°49.6'	193°26.4'	N 21°03.2'	220°51.3'	N 22°46.0'	302°27.2'	N 2°07.0'	344°14.4'	S 14°45.2'	273°48.6'	N 12°45.7'			
2	325°52.0'	208°26.3'	N 21°02.8'	235°50.5'	N 22°46.1'	317°29.5'	N 2°07.0'	359°17.0'	S 14°45.2'	288°49.4'	N 12°46.2'			
3	340°54.5'	223°26.3'	N 21°02.3'	250°49.7'	N 22°46.2'	332°31.9'	N 2°07.0'	14°19.6'	S 14°45.3'	303°50.2'	N 12°46.8'			
4	355°57.0'	238°26.2'	N 21°01.9'	265°48.9'	N 22°46.3'	347°34.3'	N 2°07.1'	29°22.2'	S 14°45.3'	318°51.0'	N 12°47.3'			
5	10°59.4'	253°26.2'	N 21°01.5'	280°48.1'	N 22°46.4'	2°36.7'	N 2°07.1'	44°24.9'	S 14°45.4'	333°51.9'	N 12°47.9'			
6	26°01.9'	268°26.1'	N 21°01.0'	295°47.3'	N 22°46.5'	17°39.1'	N 2°07.1'	59°27.5'	S 14°45.4'	348°52.7'	N 12°48.4'			
7	41°04.4'	283°26.1'	N 21°00.6'	310°46.5'	N 22°46.6'	32°41.4'	N 2°07.1'	74°30.1'	S 14°45.5'	3°53.5'	N 12°49.0'			
8	56°06.8'	298°26.0'	N 21°00.1'	325°45.7'	N 22°46.7'	47°43.8'	N 2°07.1'	89°32.7'	S 14°45.6'	18°54.3'	N 12°49.5'			
9	71°09.3'	313°26.0'	N 20°59.7'	340°44.9'	N 22°46.8'	62°46.2'	N 2°07.2'	104°35.3'	S 14°45.6'	33°55.2'	N 12°50.1'			
10	86°11.8'	328°25.9'	N 20°59.3'	355°44.1'	N 22°46.9'	77°48.6'	N 2°07.2'	119°37.9'	S 14°45.7'	48°56.0'	N 12°50.6'			
11	101°14.2'	343°25.9'	N 20°58.8'	10°43.3'	N 22°47.0'	92°51.0'	N 2°07.2'	134°40.5'	S 14°45.7'	63°56.8'	N 12°51.2'			
12	116°16.7'	358°25.9'	N 20°58.4'	25°42.5'	N 22°47.1'	107°53.3'	N 2°07.2'	149°43.1'	S 14°45.8'	78°57.6'	N 12°51.7'			
13	131°19.1'	13°25.8'	N 20°57.9'	40°41.7'	N 22°47.2'	122°55.7'	N 2°07.3'	164°45.7'	S 14°45.8'	93°58.4'	N 12°52.3'			
14	146°21.6'	28°25.8'	N 20°57.5'	55°40.8'	N 22°47.3'	137°58.1'	N 2°07.3'	179°48.4'	S 14°45.9'	108°59.3'	N 12°52.8'			
15	161°24.1'	43°25.7'	N 20°57.0'	70°40.0'	N 22°47.4'	153°00.5'	N 2°07.3'	194°51.0'	S 14°46.0'	124°00.1'	N 12°53.4'			
16	176°26.5'	58°25.7'	N 20°56.6'	85°39.2'	N 22°47.5'	168°02.9'	N 2°07.3'	209°53.6'	S 14°46.0'	139°00.9'	N 12°53.9'			
17	191°29.0'	73°25.6'	N 20°56.1'	100°38.4'	N 22°47.6'	183°05.3'	N 2°07.3'	224°56.2'	S 14°46.1'	154°01.7'	N 12°54.5'			
18	206°31.5'	88°25.6'	N 20°55.7'	115°37.6'	N 22°47.7'	198°07.6'	N 2°07.4'	239°58.8'	S 14°46.1'	169°02.5'	N 12°55.0'			
19	221°33.9'	103°25.5'	N 20°55.3'	130°36.8'	N 22°47.8'	213°10.0'	N 2°07.4'	255°01.4'	S 14°46.2'	184°03.4'	N 12°55.5'			
20	236°36.4'	118°25.5'	N 20°54.8'	145°36.0'	N 22°47.9'	228°12.4'	N 2°07.4'	270°04.0'	S 14°46.2'	199°04.2'	N 12°56.1'			
21	251°38.9'	133°25.5'	N 20°54.4'	160°35.2'	N 22°48.0'	243°14.8'	N 2°07.4'	285°06.6'	S 14°46.3'	214°05.0'	N 12°56.6'			
22	266°41.3'	148°25.4'	N 20°53.9'	175°34.4'	N 22°48.1'	258°17.2'	N 2°07.4'	300°09.2'	S 14°46.3'	229°05.8'	N 12°57.2'			
23	281°43.8'	163°25.4'	N 20°53.5'	190°33.6'	N 22°48.2'	273°19.6'	N 2°07.5'	315°11.9'	S 14°46.4'	244°06.7'	N 12°57.7'			
		SD 15.7' d -0.4'		v -0.8' d 0.1'		v 2.4' d 0.0'		v 2.6' d -0.1'		v 0.8' d 0.5'				
Mer. pass.		12 h 6 m 17 s		10 h 17 m		4 h 50 m		2 h 3 m		6 h 44 m				

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Sun	-Aldebaran	-Mars	-Jupiter	+Fomalhaut	+Saturn	+Altair	+Antares
0	300°01.4'	S 6°26.9'	12.3'	15.3'	58.5'		76°14.0'	45°14.5'	15°13.6'	25°17.4'	29°49.0'	59°36.9'	103°02.6'
1	314°32.7'	S 6°11.7'	12.4'	15.3'	58.4'		75°39.8'	44°41.7'	14°39.5'	25°43.7'	30°23.3'	60°03.1'	103°37.1'
2	329°04.1'	S 5°56.4'	12.5'	15.3'	58.4'		75°05.6'	44°08.9'	14°05.5'	26°10.2'	30°57.7'	60°29.4'	104°11.5'
3	343°35.6'	S 5°41.1'	12.6'	15.3'	58.3'		74°31.5'	43°36.2'	13°31.5'	26°37.0'	31°31.9'	60°55.8'	104°45.8'
4	358°07.2'	S 5°25.8'	12.6'	15.3'	58.3'	119°36.6'	73°57.4'	43°03.6'	12°57.6'	27°04.0'	32°06.1'	61°22.2'	105°20.2'
5	12°38.8'	S 5°10.6'	12.7'	15.3'	58.3'	119°04.8'	73°23.4'	42°31.0'	12°23.8'	27°31.2'	32°40.3'	61°48.6'	105°54.4'
6	27°10.5'	S 4°55.3'	12.8'	15.3'	58.2'	118°33.1'	72°49.5'	41°58.4'	11°50.1'	27°58.6'	33°14.5'	62°15.0'	106°28.6'
7	41°42.2'	S 4°40.0'	12.8'	15.3'	58.2'	118°01.4'	72°15.6'	41°25.9'	11°16.5'	28°26.2'	33°48.6'	62°41.5'	107°02.8'
8	56°14.1'	S 4°24.7'	12.9'	15.3'	58.1'	117°29.8'	71°41.7'	40°53.5'	10°43.0'	28°54.0'	34°22.6'	63°08.1'	107°36.9'
9	70°46.0'	S 4°09.4'	13.0'	15.3'	58.1'	116°58.2'	71°07.9'	40°21.1'	10°09.7'	29°21.9'	34°56.7'	63°34.6'	108°10.9'
10	85°17.9'	S 3°54.1'	13.0'	15.3'	58.1'	116°26.6'	70°34.1'	39°48.7'	9°36.4'	29°50.0'	35°30.6'	64°01.2'	108°44.9'
11	99°49.9'	S 3°38.8'	13.1'	15.3'	58.0'	115°55.2'	70°00.4'	39°16.4'	9°03.2'	30°18.2'	36°04.6'	64°27.8'	109°18.9'
12	114°22.0'	S 3°23.5'	13.1'	15.3'	58.0'	115°23.7'	69°26.8'	38°44.1'	8°30.2'	30°46.6'	36°38.5'	64°54.4'	109°52.8'
13	128°54.2'	S 3°08.3'	13.2'	15.3'	57.9'	114°52.3'	68°53.2'	38°11.9'	7°57.4'	31°15.1'	37°12.3'	65°21.1'	110°26.7'
14	143°26.4'	S 2°53.0'	13.3'	15.3'	57.9'	114°21.0'	68°19.6'	37°39.8'	7°24.8'	31°43.7'	37°46.1'	65°47.8'	111°00.5'
15	157°58.6'	S 2°37.7'	13.3'	15.3'	57.9'	113°49.7'	67°46.1'	37°07.6'	6°52.4'	32°12.5'	38°19.9'	66°14.5'	111°34.3'
16	172°30.9'	S 2°22.5'	13.4'	15.2'	57.8'	113°18.4'	67°12.7'	36°35.6'	6°20.3'	32°41.3'	38°53.6'	66°41.2'	112°08.0'
17	187°03.3'	S 2°07.2'	13.4'	15.2'	57.8'	112°47.2'	66°39.3'	36°03.6'	5°48.5'	33°10.2'	39°27.3'	67°07.9'	112°41.6'
18	201°35.7'	S 1°52.0'	13.5'	15.2'	57.7'	112°16.0'	66°05.9'	35°31.6'	5°17.2'	33°39.2'	40°00.9'	67°34.6'	113°15.3'
19	216°08.2'	S 1°36.8'	13.5'	15.2'	57.7'	111°44.9'	65°32.6'	34°59.7'	4°46.3'	34°08.3'	40°34.5'	68°01.4'	113°48.8'
20	230°40.7'	S 1°21.6'	13.6'	15.2'	57.7'	111°13.9'	64°59.4'	34°27.8'		34°37.5'	41°08.1'	68°28.1'	114°22.3'
21	245°13.3'	S 1°06.4'	13.6'	15.2'	57.6'	110°42.9'	64°26.2'	33°56.0'		35°06.8'	41°41.6'	68°54.9'	114°55.8'
22	259°45.9'	S 0°51.2'	13.7'	15.2'	57.6'	110°11.9'	63°53.0'	33°24.2'		35°36.1'	42°15.1'	69°21.7'	115°29.2'
23	274°18.6'	S 0°36.1'	13.7'	15.1'	57.5'	109°41.0'	63°19.9'	32°52.5'		36°05.5'	42°48.5'	69°48.5'	116°02.6'
Mer. pass.		4 h 8 m SD 15.9'	phase 76%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.6'	Acrux	+0.8	173°02.6'	S 63°13.6'	Capella	+0.1	280°25.3'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.2'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°10.1'	N 89°21.2'
Rigil Kent	-0.0	139°42.9'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.1'	Achernar	+0.5	335°21.7'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.7'				
Hadar	+0.6	148°38.8'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	296°46.3'	178°25.3'	N 20°53.0'	205°32.8'	N 22°48.2'	288°21.9'	N 2°07.5'	330°14.5'	S 14°46.5'	259°07.5'	N 12°58.3'			
1	311°48.7'	193°25.3'	N 20°52.6'	220°31.9'	N 22°48.3'	303°24.3'	N 2°07.5'	345°17.1'	S 14°46.5'	274°08.3'	N 12°58.8'			
2	326°51.2'	208°25.2'	N 20°52.1'	235°31.1'	N 22°48.4'	318°26.7'	N 2°07.5'	0°19.7'	S 14°46.6'	289°09.1'	N 12°59.4'			
3	341°53.6'	223°25.2'	N 20°51.7'	250°30.3'	N 22°48.5'	333°29.1'	N 2°07.5'	15°22.3'	S 14°46.6'	304°10.0'	N 12°59.9'			
4	356°56.1'	238°25.2'	N 20°51.2'	265°29.5'	N 22°48.6'	348°31.5'	N 2°07.6'	30°24.9'	S 14°46.7'	319°10.8'	N 13°00.4'			
5	11°58.6'	253°25.1'	N 20°50.8'	280°28.7'	N 22°48.7'	3°33.9'	N 2°07.6'	45°27.5'	S 14°46.7'	334°11.6'	N 13°01.0'			
6	27°01.0'	268°25.1'	N 20°50.3'	295°27.9'	N 22°48.7'	18°36.3'	N 2°07.6'	60°30.2'	S 14°46.8'	349°12.4'	N 13°01.5'			
7	42°03.5'	283°25.0'	N 20°49.8'	310°27.1'	N 22°48.8'	33°38.6'	N 2°07.6'	75°32.8'	S 14°46.9'	4°13.2'	N 13°02.1'			
8	57°06.0'	298°25.0'	N 20°49.4'	325°26.3'	N 22°48.9'	48°41.0'	N 2°07.6'	90°35.4'	S 14°46.9'	19°14.1'	N 13°02.6'			
9	72°08.4'	313°24.9'	N 20°48.9'	340°25.5'	N 22°49.0'	63°43.4'	N 2°07.7'	105°38.0'	S 14°47.0'	34°14.9'	N 13°03.1'			
10	87°10.9'	328°24.9'	N 20°48.5'	355°24.7'	N 22°49.0'	78°45.8'	N 2°07.7'	120°40.6'	S 14°47.0'	49°15.7'	N 13°03.7'			
11	102°13.4'	343°24.9'	N 20°48.0'	10°23.8'	N 22°49.1'	93°48.2'	N 2°07.7'	135°43.2'	S 14°47.1'	64°16.5'	N 13°04.2'			
12	117°15.8'	358°24.8'	N 20°47.6'	25°23.0'	N 22°49.2'	108°50.6'	N 2°07.7'	150°45.8'	S 14°47.1'	79°17.4'	N 13°04.8'			
13	132°18.3'	13°24.8'	N 20°47.1'	40°22.2'	N 22°49.3'	123°53.0'	N 2°07.7'	165°48.4'	S 14°47.2'	94°18.2'	N 13°05.3'			
14	147°20.7'	28°24.7'	N 20°46.6'	55°21.4'	N 22°49.3'	138°55.4'	N 2°07.8'	180°51.1'	S 14°47.3'	109°19.0'	N 13°05.9'			
15	162°23.2'	43°24.7'	N 20°46.2'	70°20.6'	N 22°49.4'	153°57.8'	N 2°07.8'	195°53.7'	S 14°47.3'	124°19.8'	N 13°06.4'			
16	177°25.7'	58°24.7'	N 20°45.7'	85°19.8'	N 22°49.5'	169°00.1'	N 2°07.8'	210°56.3'	S 14°47.4'	139°20.7'	N 13°06.9'			
17	192°28.1'	73°24.6'	N 20°45.3'	100°19.0'	N 22°49.5'	184°02.5'	N 2°07.8'	225°58.9'	S 14°47.4'	154°21.5'	N 13°07.5'			
18	207°30.6'	88°24.6'	N 20°44.8'	115°18.2'	N 22°49.6'	199°04.9'	N 2°07.8'	241°01.5'	S 14°47.5'	169°22.3'	N 13°08.0'			
19	222°33.1'	103°24.6'	N 20°44.3'	130°17.4'	N 22°49.7'	214°07.3'	N 2°07.8'	256°04.1'	S 14°47.5'	184°23.1'	N 13°08.6'			
20	237°35.5'	118°24.5'	N 20°43.9'	145°16.5'	N 22°49.7'	229°09.7'	N 2°07.9'	271°06.7'	S 14°47.6'	199°24.0'	N 13°09.1'			
21	252°38.0'	133°24.5'	N 20°43.4'	160°15.7'	N 22°49.8'	244°12.1'	N 2°07.9'	286°09.4'	S 14°47.7'	214°24.8'	N 13°09.6'			
22	267°40.5'	148°24.4'	N 20°43.0'	175°14.9'	N 22°49.9'	259°14.5'	N 2°07.9'	301°12.0'	S 14°47.7'	229°25.6'	N 13°10.2'			
23	282°42.9'	163°24.4'	N 20°42.5'	190°14.1'	N 22°49.9'	274°16.9'	N 2°07.9'	316°14.6'	S 14°47.8'	244°26.4'	N 13°10.7'			
		SD 15.7' d -0.5'		v -0.8' d 0.1'		v 2.4' d 0.0'		v 2.6' d -0.1'		v 0.8' d 0.5'				
Mer. pass.		12 h 6 m 21 s		10 h 18 m		4 h 46 m		1 h 59 m		6 h 43 m				

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Sun	-Aldebaran	-Mars	-Jupiter	+Fomalhaut	+Saturn	+Altair	+Rigel Kent
0	288°51.3'	S 0°21.0'	13.8'	15.1'	57.5'	109°10.1'	62°46.9'	32°20.8'		36°34.9'	43°21.9'	70°15.2'	113°53.6'
1	303°24.0'	S 0°05.9'	13.8'	15.1'	57.5'	108°39.2'	62°13.9'	31°49.1'		37°04.4'	43°55.2'	70°42.0'	114°16.5'
2	317°56.8'	N 0°09.2'	13.8'	15.1'	57.4'	108°08.5'	61°40.9'	31°17.5'		37°34.0'	44°28.5'	71°08.8'	114°39.3'
3	332°29.7'	N 0°24.3'	13.9'	15.0'	57.4'	107°37.7'	61°08.0'	30°46.0'		38°03.6'	45°01.7'	71°35.6'	115°02.0'
4	347°02.5'	N 0°39.4'	13.9'	15.0'	57.4'	107°07.0'	60°35.2'	30°14.5'		38°33.2'	45°34.9'	72°02.4'	115°24.5'
5	1°35.4'	N 0°54.4'	13.9'	15.0'	57.3'	106°36.4'	60°02.3'	29°43.1'		39°02.9'	46°08.1'	72°29.2'	115°47.0'
6	16°08.4'	N 1°09.4'	14.0'	15.0'	57.3'	106°05.8'	59°29.6'	29°11.7'		39°32.6'	46°41.2'	72°56.0'	116°09.3'
7	30°41.4'	N 1°24.4'	14.0'	14.9'	57.2'	105°35.2'	58°56.9'	28°40.3'		40°02.3'	47°14.3'	73°22.8'	116°31.6'
8	45°14.4'	N 1°39.3'	14.1'	14.9'	57.2'	105°04.7'	58°24.2'	28°09.0'		40°32.1'	47°47.3'	73°49.6'	116°53.7'
9	59°47.5'	N 1°54.2'	14.1'	14.9'	57.2'	104°34.2'	57°51.6'	27°37.7'		41°01.9'	48°20.3'	74°16.3'	117°15.7'
10	74°20.5'	N 2°09.1'	14.1'	14.9'	57.1'	104°03.8'	57°19.1'	27°06.5'	4°25.1'	41°31.7'	48°53.3'	74°43.1'	117°37.5'
11	88°53.7'	N 2°24.0'	14.1'	14.8'	57.1'	103°33.4'	56°46.6'	26°35.3'	4°54.8'	42°01.6'	49°26.2'	75°09.9'	117°59.3'
12	103°26.8'	N 2°38.8'	14.2'	14.8'	57.0'	103°03.1'	56°14.1'	26°04.2'	5°25.0'	42°31.5'	49°59.0'	75°36.6'	118°20.9'
13	117°60.0'	N 2°53.6'	14.2'	14.8'	57.0'	102°32.8'	55°41.7'	25°33.1'	5°55.6'	43°01.4'	50°31.8'	76°03.4'	118°42.4'
14	132°33.2'	N 3°08.4'	14.2'	14.7'	57.0'	102°02.6'	55°09.3'	25°02.1'	6°26.6'	43°31.3'	51°04.6'	76°30.1'	119°03.8'
15	147°06.4'	N 3°23.1'	14.2'	14.7'	56.9'	101°32.3'	54°37.0'	24°31.1'	6°57.7'	44°01.2'	51°37.4'	76°56.8'	119°25.0'
16	161°39.6'	N 3°37.8'	14.3'	14.7'	56.9'	101°02.2'	54°04.7'	24°00.1'	7°29.1'	44°31.1'	52°10.1'	77°23.5'	119°46.1'
17	176°12.9'	N 3°52.5'	14.3'	14.6'	56.9'	100°32.1'	53°32.5'	23°29.2'	8°00.5'	45°01.1'	52°42.7'	77°50.2'	
18	190°46.2'	N 4°07.1'	14.3'	14.6'	56.8'	100°02.0'	53°00.3'	22°58.4'	8°32.0'	45°31.0'	53°15.3'	78°16.9'	
19	205°19.5'	N 4°21.7'	14.3'	14.6'	56.8'	99°32.0'	52°28.2'	22°27.5'	9°03.7'	46°01.0'	53°47.9'	78°43.6'	
20	219°52.8'	N 4°36.2'	14.4'	14.5'	56.7'	99°02.0'	51°56.1'	21°56.8'	9°35.3'	46°30.9'	54°20.4'	79°10.3'	
21	234°26.2'	N 4°50.8'	14.4'	14.5'	56.7'	98°32.0'	51°24.1'	21°26.0'	10°07.0'	47°00.9'	54°52.9'	79°36.9'	
22	248°59.6'	N 5°05.2'	14.4'	14.4'	56.7'	98°02.1'	50°52.1'	20°55.4'	10°38.7'	47°30.9'	55°25.4'	80°03.5'	
23	263°33.0'	N 5°19.7'	14.4'	14.4'	56.6'	97°32.2'	50°20.2'	20°24.7'	11°10.5'	48°00.8'	55°57.8'	80°30.1'	
Mer. pass.		4 h 53 m SD 15.7' phase 66%											

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.6'	Acrux	+0.8	173°02.6'	S 63°13.6'	Capella	+0.1	280°25.3'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.2'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°09.6'	N 89°21.2'
Rigel Kent	-0.0	139°42.9'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.1'	Achernar	+0.5	335°21.7'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.7'				
Hadar	+0.6	148°38.8'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

Wednesday 20 July 2022 UT1

h	Aries	Sun		Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	297°45.4'	178°24.4'	N 20°42.0'	205°13.3'	N 22°50.0'	289°19.3'	N 2°07.9'	331°17.2'	S 14°47.8'	259°27.3'	N 13°11.2'
1	312°47.9'	193°24.3'	N 20°41.6'	220°12.5'	N 22°50.0'	304°21.7'	N 2°08.0'	346°19.8'	S 14°47.9'	274°28.1'	N 13°11.8'
2	327°50.3'	208°24.3'	N 20°41.1'	235°11.7'	N 22°50.1'	319°24.1'	N 2°08.0'	1°22.4'	S 14°47.9'	289°28.9'	N 13°12.3'
3	342°52.8'	223°24.3'	N 20°40.6'	250°10.9'	N 22°50.1'	334°26.5'	N 2°08.0'	16°25.0'	S 14°48.0'	304°29.7'	N 13°12.9'
4	357°55.2'	238°24.2'	N 20°40.2'	265°10.0'	N 22°50.2'	349°28.8'	N 2°08.0'	31°27.7'	S 14°48.1'	319°30.6'	N 13°13.4'
5	12°57.7'	253°24.2'	N 20°39.7'	280°09.2'	N 22°50.2'	4°31.2'	N 2°08.0'	46°30.3'	S 14°48.1'	334°31.4'	N 13°13.9'
6	28°00.2'	268°24.1'	N 20°39.2'	295°08.4'	N 22°50.3'	19°33.6'	N 2°08.0'	61°32.9'	S 14°48.2'	349°32.2'	N 13°14.5'
7	43°02.6'	283°24.1'	N 20°38.8'	310°07.6'	N 22°50.4'	34°36.0'	N 2°08.1'	76°35.5'	S 14°48.2'	4°33.0'	N 13°15.0'
8	58°05.1'	298°24.1'	N 20°38.3'	325°06.8'	N 22°50.4'	49°38.4'	N 2°08.1'	91°38.1'	S 14°48.3'	19°33.9'	N 13°15.5'
9	73°07.6'	313°24.0'	N 20°37.8'	340°06.0'	N 22°50.5'	64°40.8'	N 2°08.1'	106°40.7'	S 14°48.4'	34°34.7'	N 13°16.1'
10	88°10.0'	328°24.0'	N 20°37.3'	355°05.2'	N 22°50.5'	79°43.2'	N 2°08.1'	121°43.4'	S 14°48.4'	49°35.5'	N 13°16.6'
11	103°12.5'	343°24.0'	N 20°36.9'	10°04.3'	N 22°50.5'	94°45.6'	N 2°08.1'	136°46.0'	S 14°48.5'	64°36.3'	N 13°17.2'
12	118°15.0'	358°23.9'	N 20°36.4'	25°03.5'	N 22°50.6'	109°48.0'	N 2°08.1'	151°48.6'	S 14°48.5'	79°37.2'	N 13°17.7'
13	133°17.4'	13°23.9'	N 20°35.9'	40°02.7'	N 22°50.6'	124°50.4'	N 2°08.1'	166°51.2'	S 14°48.6'	94°38.0'	N 13°18.2'
14	148°19.9'	28°23.9'	N 20°35.5'	55°01.9'	N 22°50.7'	139°52.8'	N 2°08.2'	181°53.8'	S 14°48.6'	109°38.8'	N 13°18.8'
15	163°22.4'	43°23.8'	N 20°35.0'	70°01.1'	N 22°50.7'	154°55.2'	N 2°08.2'	196°56.4'	S 14°48.7'	124°39.6'	N 13°19.3'
16	178°24.8'	58°23.8'	N 20°34.5'	85°00.3'	N 22°50.8'	169°57.6'	N 2°08.2'	211°59.1'	S 14°48.8'	139°40.5'	N 13°19.8'
17	193°27.3'	73°23.8'	N 20°34.0'	99°59.5'	N 22°50.8'	184°60.0'	N 2°08.2'	227°01.7'	S 14°48.8'	154°41.3'	N 13°20.4'
18	208°29.7'	88°23.7'	N 20°33.6'	114°58.6'	N 22°50.8'	200°02.4'	N 2°08.2'	242°04.3'	S 14°48.9'	169°42.1'	N 13°20.9'
19	223°32.2'	103°23.7'	N 20°33.1'	129°57.8'	N 22°50.9'	215°04.8'	N 2°08.2'	257°06.9'	S 14°48.9'	184°42.9'	N 13°21.4'
20	238°34.7'	118°23.7'	N 20°32.6'	144°57.0'	N 22°50.9'	230°07.2'	N 2°08.3'	272°09.5'	S 14°49.0'	199°43.8'	N 13°22.0'
21	253°37.1'	133°23.6'	N 20°32.1'	159°56.2'	N 22°51.0'	245°09.6'	N 2°08.3'	287°12.1'	S 14°49.0'	214°44.6'	N 13°22.5'
22	268°39.6'	148°23.6'	N 20°31.6'	174°55.4'	N 22°51.0'	260°12.0'	N 2°08.3'	302°14.8'	S 14°49.1'	229°45.4'	N 13°23.0'
23	283°42.1'	163°23.6'	N 20°31.2'	189°54.6'	N 22°51.0'	275°14.4'	N 2°08.3'	317°17.4'	S 14°49.2'	244°46.2'	N 13°23.6'
		SD 15.7' d -0.5'		v -0.8' d 0.0'		v 2.4' d 0.0'		v 2.6' d -0.1'		v 0.8' d 0.5'	
Mer. pass.		12 h 6 m 25 s		10 h 20 m		4 h 42 m		1 h 55 m		6 h 42 m	

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Sun	-Rigel	-Aldebaran	-Mars	+Jupiter	+Fomalhaut	+Saturn	+Altair
0	278°06.4'	N 5°34.1'	14.4'	14.4'	56.6'	97°02.4'	60°39.8'	49°48.3'	19°23.6'	11°42.2'	48°30.8'	56°30.1'	80°56.7'
1	292°39.8'	N 5°48.4'	14.4'	14.3'	56.6'	96°32.6'	60°14.7'	49°16.5'	19°23.6'	12°14.0'	49°00.8'	57°02.5'	81°23.3'
2	307°13.2'	N 6°02.7'	14.4'	14.3'	56.5'	96°02.9'	59°49.8'	48°44.7'	18°53.0'	12°45.7'	49°30.7'	57°34.8'	81°49.8'
3	321°46.6'	N 6°17.0'	14.4'	14.2'	56.5'	95°33.2'	59°25.0'	48°13.0'	18°22.6'	13°17.5'	50°00.7'	58°07.0'	82°16.4'
4	336°20.1'	N 6°31.2'	14.5'	14.2'	56.5'	95°03.5'	59°00.3'	47°41.3'	17°52.1'	13°49.2'	50°30.7'	58°39.2'	82°42.9'
5	350°53.5'	N 6°45.4'	14.5'	14.1'	56.4'	94°33.9'	58°35.7'	47°09.6'	17°21.7'	14°20.9'	51°00.6'	59°11.4'	83°09.4'
6	5°27.0'	N 6°59.5'	14.5'	14.1'	56.4'	94°04.3'	58°11.1'	46°38.0'	16°51.4'	14°52.6'	51°30.6'	59°43.5'	83°35.8'
7	20°00.5'	N 7°13.6'	14.5'	14.0'	56.4'	93°34.8'	57°46.7'	46°06.5'	16°21.1'	15°24.3'	52°00.5'	60°15.6'	84°02.3'
8	34°33.9'	N 7°27.6'	14.5'	14.0'	56.3'	93°05.3'	57°22.4'	45°35.0'	15°50.8'	15°56.0'	52°30.4'	60°47.7'	84°28.7'
9	49°07.4'	N 7°41.6'	14.5'	13.9'	56.3'	92°35.8'	56°58.3'	45°03.5'	15°20.6'	16°27.6'	53°00.4'	61°19.7'	84°55.1'
10	63°40.9'	N 7°55.6'	14.5'	13.9'	56.3'	92°06.4'	56°34.2'	44°32.1'	14°50.4'	16°59.2'	53°30.3'	61°51.7'	85°21.5'
11	78°14.4'	N 8°09.5'	14.5'	13.8'	56.2'	91°37.0'	56°10.2'	44°00.7'	14°20.3'	17°30.8'	54°00.2'	62°23.6'	85°47.9'
12	92°47.9'	N 8°23.3'	14.5'	13.8'	56.2'	91°07.7'	55°46.4'	43°29.4'	13°50.2'	18°02.4'	54°30.1'	62°55.5'	86°14.2'
13	107°21.3'	N 8°37.1'	14.5'	13.7'	56.2'	90°38.3'	55°22.7'	42°58.2'	13°20.2'	18°33.9'	54°60.0'	63°27.4'	86°40.5'
14	121°54.8'	N 8°50.8'	14.5'	13.7'	56.1'	90°09.1'	54°59.1'	42°26.9'	12°50.2'	19°05.5'	55°29.9'	63°59.3'	87°06.8'
15	136°28.3'	N 9°04.5'	14.5'	13.6'	56.1'	89°39.8'	54°35.6'	41°55.8'	12°20.2'	19°36.9'	55°59.7'	64°31.1'	87°33.0'
16	151°01.8'	N 9°18.1'	14.5'	13.6'	56.1'	89°10.6'	54°12.2'	41°24.6'	11°50.3'	20°08.4'	56°29.6'	65°02.8'	87°59.3'
17	165°35.3'	N 9°31.7'	14.5'	13.5'	56.0'	88°41.5'	53°49.0'	40°53.6'	11°20.4'	20°39.8'	56°59.4'	65°34.5'	88°25.5'
18	180°08.7'	N 9°45.2'	14.5'	13.5'	56.0'	88°12.3'	53°25.8'	40°22.5'	10°50.6'	21°11.2'	57°29.2'	66°06.2'	88°51.6'
19	194°42.2'	N 9°58.7'	14.5'	13.4'	56.0'	87°43.2'	53°02.9'	39°51.5'	10°20.8'	21°42.6'	57°59.1'	66°37.9'	89°17.8'
20	209°15.6'	N 10°12.1'	14.4'	13.3'	55.9'	87°14.2'	52°40.0'	39°20.6'	9°51.1'	22°14.0'	58°28.8'	67°09.5'	89°43.9'
21	223°49.1'	N 10°25.4'	14.4'	13.3'	55.9'	86°45.2'	52°17.3'	38°49.7'	9°21.4'	22°45.3'	58°58.6'	67°41.1'	90°10.0'
22	238°22.5'	N 10°38.7'	14.4'	13.2'	55.9'	86°16.2'	51°54.7'	38°18.9'	8°51.7'	23°16.6'	59°28.4'	68°12.7'	90°36.0'
23	252°56.0'	N 10°51.9'	14.4'	13.2'	55.8'	85°47.2'	51°32.2'	37°48.1'	8°22.2'	23°47.8'	59°58.2'	68°44.2'	91°02.1'
Mer. pass.		5 h 38 m SD 15.4'		phase 56%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.6'	Acrux	+0.8	173°02.6'	S 63°13.6'	Capella	+0.1	280°25.3'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	N 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.3'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.2'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°09.2'	N 89°21.2'
Rigil Kent	-0.0	139°42.9'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.0'	Achernar	+0.5	335°21.7'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.7'				
Hadar	+0.6	148°38.8'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

Thursday 21 July 2022 UT1

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	298°44.5'	178°23.5'	N 20°30.7'	204°53.8'	N 22°51.1'	290°16.8'	N 2°08.3'	332°20.0'	S 14°49.2'	259°47.1'	N 13°24.1'			
1	313°47.0'	193°23.5'	N 20°30.2'	219°52.9'	N 22°51.1'	305°19.2'	N 2°08.3'	347°22.6'	S 14°49.3'	274°47.9'	N 13°24.6'			
2	328°49.5'	208°23.5'	N 20°29.7'	234°52.1'	N 22°51.1'	320°21.6'	N 2°08.3'	2°25.2'	S 14°49.3'	289°48.7'	N 13°25.2'			
3	343°51.9'	223°23.4'	N 20°29.3'	249°51.3'	N 22°51.1'	335°24.0'	N 2°08.4'	17°27.8'	S 14°49.4'	304°49.6'	N 13°25.7'			
4	358°54.4'	238°23.4'	N 20°28.8'	264°50.5'	N 22°51.2'	350°26.4'	N 2°08.4'	32°30.5'	S 14°49.5'	319°50.4'	N 13°26.2'			
5	13°56.8'	253°23.4'	N 20°28.3'	279°49.7'	N 22°51.2'	5°28.8'	N 2°08.4'	47°33.1'	S 14°49.5'	334°51.2'	N 13°26.7'			
6	28°59.3'	268°23.4'	N 20°27.8'	294°48.9'	N 22°51.2'	20°31.2'	N 2°08.4'	62°35.7'	S 14°49.6'	349°52.0'	N 13°27.3'			
7	44°01.8'	283°23.3'	N 20°27.3'	309°48.0'	N 22°51.2'	35°33.6'	N 2°08.4'	77°38.3'	S 14°49.6'	4°52.9'	N 13°27.8'			
8	59°04.2'	298°23.3'	N 20°26.8'	324°47.2'	N 22°51.3'	50°36.0'	N 2°08.4'	92°40.9'	S 14°49.7'	19°53.7'	N 13°28.3'			
9	74°06.7'	313°23.3'	N 20°26.4'	339°46.4'	N 22°51.3'	65°38.4'	N 2°08.4'	107°43.5'	S 14°49.7'	34°54.5'	N 13°28.9'			
10	89°09.2'	328°23.2'	N 20°25.9'	354°45.6'	N 22°51.3'	80°40.8'	N 2°08.4'	122°46.2'	S 14°49.8'	49°55.4'	N 13°29.4'			
11	104°11.6'	343°23.2'	N 20°25.4'	9°44.8'	N 22°51.3'	95°43.2'	N 2°08.5'	137°48.8'	S 14°49.9'	64°56.2'	N 13°29.9'			
12	119°14.1'	358°23.2'	N 20°24.9'	24°44.0'	N 22°51.3'	110°45.6'	N 2°08.5'	152°51.4'	S 14°49.9'	79°57.0'	N 13°30.5'			
13	134°16.6'	13°23.1'	N 20°24.4'	39°43.1'	N 22°51.4'	125°48.0'	N 2°08.5'	167°54.0'	S 14°50.0'	94°57.8'	N 13°31.0'			
14	149°19.0'	28°23.1'	N 20°23.9'	54°42.3'	N 22°51.4'	140°50.4'	N 2°08.5'	182°56.6'	S 14°50.0'	109°58.7'	N 13°31.5'			
15	164°21.5'	43°23.1'	N 20°23.4'	69°41.5'	N 22°51.4'	155°52.8'	N 2°08.5'	197°59.3'	S 14°50.1'	124°59.5'	N 13°32.0'			
16	179°24.0'	58°23.1'	N 20°22.9'	84°40.7'	N 22°51.4'	170°55.2'	N 2°08.5'	213°01.9'	S 14°50.2'	140°00.3'	N 13°32.6'			
17	194°26.4'	73°23.0'	N 20°22.5'	99°39.9'	N 22°51.4'	185°57.6'	N 2°08.5'	228°04.5'	S 14°50.2'	155°01.1'	N 13°33.1'			
18	209°28.9'	88°23.0'	N 20°22.0'	114°39.1'	N 22°51.4'	201°00.0'	N 2°08.5'	243°07.1'	S 14°50.3'	170°02.0'	N 13°33.6'			
19	224°31.3'	103°23.0'	N 20°21.5'	129°38.2'	N 22°51.4'	216°02.4'	N 2°08.6'	258°09.7'	S 14°50.3'	185°02.8'	N 13°34.2'			
20	239°33.8'	118°23.0'	N 20°21.0'	144°37.4'	N 22°51.5'	231°04.8'	N 2°08.6'	273°12.3'	S 14°50.4'	200°03.6'	N 13°34.7'			
21	254°36.3'	133°22.9'	N 20°20.5'	159°36.6'	N 22°51.5'	246°07.3'	N 2°08.6'	288°15.0'	S 14°50.4'	215°04.5'	N 13°35.2'			
22	269°38.7'	148°22.9'	N 20°20.0'	174°35.8'	N 22°51.5'	261°09.7'	N 2°08.6'	303°17.6'	S 14°50.5'	230°05.3'	N 13°35.7'			
23	284°41.2'	163°22.9'	N 20°19.5'	189°35.0'	N 22°51.5'	276°12.1'	N 2°08.6'	318°20.2'	S 14°50.6'	245°06.1'	N 13°36.3'			
		SD 15.7' d -0.5'		v -0.8' d 0.0'		v 2.4' d 0.0'		v 2.6' d -0.1'		v 0.8' d 0.5'				
Mer. pass.		12 h 6 m 28 s		10 h 21 m		4 h 38 m		1 h 50 m		6 h 41 m				

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Sun	-Rigel	-Aldebaran	-Mars	+Jupiter	+Fomalhaut	+Achernar	+Saturn
0	267°29.4'	N 11°05.1'	14.4'	13.1'	55.8'	85°18.3'	51°09.9'	37°17.4'	7°52.6'	24°19.1'	60°27.9'	68°25.3'	69°15.7'
1	282°02.8'	N 11°18.2'	14.4'	13.0'	55.8'	84°49.4'	50°47.7'	36°46.7'	7°23.2'	24°50.3'	60°57.6'	68°40.4'	69°47.1'
2	296°36.2'	N 11°31.2'	14.4'	13.0'	55.7'	84°20.6'	50°25.6'	36°16.0'	6°53.8'	25°21.4'	61°27.3'	68°55.5'	70°18.6'
3	311°09.6'	N 11°44.2'	14.4'	12.9'	55.7'	83°51.8'	50°03.7'	35°45.4'	6°24.5'	25°52.6'	61°57.0'	69°10.7'	70°49.9'
4	325°42.9'	N 11°57.1'	14.3'	12.9'	55.7'	83°23.0'	49°42.0'	35°14.9'	5°55.2'	26°23.7'	62°26.7'	69°25.9'	71°21.3'
5	340°16.3'	N 12°10.0'	14.3'	12.8'	55.7'	82°54.2'	49°20.4'	34°44.4'	5°26.1'	26°54.8'	62°56.4'	69°41.3'	71°52.6'
6	354°49.6'	N 12°22.8'	14.3'	12.7'	55.6'	82°25.5'	48°58.9'	34°14.0'	4°57.1'	27°25.9'	63°26.0'	69°56.7'	72°23.9'
7	9°22.9'	N 12°35.5'	14.3'	12.7'	55.6'	81°56.8'	48°37.6'	33°43.6'	4°28.2'	27°56.9'	63°55.6'	70°12.1'	72°55.2'
8	23°56.2'	N 12°48.2'	14.3'	12.6'	55.6'	81°28.2'	48°16.4'	33°13.2'	3°59.5'	28°27.9'	64°25.2'	70°27.6'	73°26.4'
9	38°29.5'	N 13°00.8'	14.3'	12.5'	55.5'	80°59.6'	47°55.4'	32°43.0'	3°31.1'	28°58.9'	64°54.8'	70°43.2'	73°57.6'
10	53°02.7'	N 13°13.3'	14.2'	12.5'	55.5'	80°31.0'	47°34.6'	32°12.7'	3°03.0'	29°29.8'	65°24.4'	70°58.8'	74°28.8'
11	67°36.0'	N 13°25.8'	14.2'	12.4'	55.5'	80°02.4'	47°13.9'	31°42.6'		30°00.7'	65°54.0'	71°14.5'	74°59.9'
12	82°09.2'	N 13°38.2'	14.2'	12.3'	55.5'	79°33.9'	46°53.4'	31°12.4'		30°31.6'	66°23.5'	71°30.3'	75°31.0'
13	96°42.4'	N 13°50.5'	14.2'	12.3'	55.4'	79°05.4'	46°33.1'	30°42.4'		31°02.5'	66°53.0'	71°46.1'	76°02.1'
14	111°15.5'	N 14°02.7'	14.1'	12.2'	55.4'	78°36.9'	46°12.9'	30°12.4'		31°33.3'	67°22.6'	72°01.9'	76°33.2'
15	125°48.7'	N 14°14.9'	14.1'	12.1'	55.4'	78°08.5'	45°52.9'	29°42.4'		32°04.1'	67°52.0'	72°17.8'	77°04.2'
16	140°21.8'	N 14°27.0'	14.1'	12.0'	55.4'	77°40.1'	45°33.1'	29°12.5'		32°34.9'	68°21.5'	72°33.8'	77°35.2'
17	154°54.9'	N 14°39.1'	14.1'	12.0'	55.3'	77°11.7'	45°13.5'	28°42.7'		33°05.7'	68°51.0'	72°49.8'	78°06.1'
18	169°27.9'	N 14°51.0'	14.0'	11.9'	55.3'	76°43.3'	44°54.0'	28°12.9'		33°36.4'	69°20.4'	73°05.8'	78°37.1'
19	184°01.0'	N 15°02.9'	14.0'	11.8'	55.3'	76°15.0'	44°34.7'	27°43.2'		34°07.1'	69°49.8'	73°21.9'	79°08.0'
20	198°34.0'	N 15°14.8'	14.0'	11.7'	55.2'	75°46.7'	44°15.6'	27°13.6'		34°37.8'	70°19.2'	73°38.1'	79°38.9'
21	213°07.0'	N 15°26.5'	13.9'	11.7'	55.2'	75°18.5'	43°56.7'	26°44.0'	2°39.1'	35°08.4'	70°48.6'	73°54.3'	80°09.7'
22	227°39.9'	N 15°38.2'	13.9'	11.6'	55.2'	74°50.2'	43°38.0'	26°14.5'	3°06.5'	35°39.1'	71°18.0'	74°10.5'	80°40.6'
23	242°12.8'	N 15°49.8'	13.9'	11.5'	55.2'	74°22.0'	43°19.5'	25°45.1'	3°34.3'	36°09.7'	71°47.3'	74°26.8'	81°11.4'
Mer. pass.		6 h 21 m SD 15.2'		phase 46%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.6'	Acrux	+0.8	173°02.6'	S 63°13.6'	Capella	+0.1	280°25.3'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.4'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.2'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°08.6'	N 89°21.2'
Rigel Kent	-0.0	139°42.9'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.0'	Achernar	+0.5	335°21.7'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.7'				
Hadar	+0.6	148°38.8'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	299°43.7'	178°22.8'	N 20°19.0'	204°34.2'	N 22°51.5'	291°14.5'	N 2°08.6'	333°22.8'	S 14°50.6'	260°07.0'	N 13°36.8'			
1	314°46.1'	193°22.8'	N 20°18.5'	219°33.3'	N 22°51.5'	306°16.9'	N 2°08.6'	348°25.4'	S 14°50.7'	275°07.8'	N 13°37.3'			
2	329°48.6'	208°22.8'	N 20°18.0'	234°32.5'	N 22°51.5'	321°19.3'	N 2°08.6'	3°28.1'	S 14°50.7'	290°08.6'	N 13°37.8'			
3	344°51.1'	223°22.8'	N 20°17.5'	249°31.7'	N 22°51.5'	336°21.7'	N 2°08.6'	18°30.7'	S 14°50.8'	305°09.4'	N 13°38.4'			
4	359°53.5'	238°22.7'	N 20°17.0'	264°30.9'	N 22°51.5'	351°24.1'	N 2°08.6'	33°33.3'	S 14°50.9'	320°10.3'	N 13°38.9'			
5	14°56.0'	253°22.7'	N 20°16.5'	279°30.1'	N 22°51.5'	6°26.5'	N 2°08.7'	48°35.9'	S 14°50.9'	335°11.1'	N 13°39.4'			
6	29°58.5'	268°22.7'	N 20°16.0'	294°29.2'	N 22°51.5'	21°28.9'	N 2°08.7'	63°38.5'	S 14°51.0'	350°11.9'	N 13°39.9'			
7	45°00.9'	283°22.7'	N 20°15.5'	309°28.4'	N 22°51.5'	36°31.3'	N 2°08.7'	78°41.2'	S 14°51.0'	5°12.8'	N 13°40.5'			
8	60°03.4'	298°22.6'	N 20°15.0'	324°27.6'	N 22°51.5'	51°33.7'	N 2°08.7'	93°43.8'	S 14°51.1'	20°13.6'	N 13°41.0'			
9	75°05.8'	313°22.6'	N 20°14.5'	339°26.8'	N 22°51.5'	66°36.2'	N 2°08.7'	108°46.4'	S 14°51.2'	35°14.4'	N 13°41.5'			
10	90°08.3'	328°22.6'	N 20°14.0'	354°26.0'	N 22°51.5'	81°38.6'	N 2°08.7'	123°49.0'	S 14°51.2'	50°15.3'	N 13°42.0'			
11	105°10.8'	343°22.6'	N 20°13.5'	9°25.1'	N 22°51.5'	96°41.0'	N 2°08.7'	138°51.6'	S 14°51.3'	65°16.1'	N 13°42.6'			
12	120°13.2'	358°22.6'	N 20°13.0'	24°24.3'	N 22°51.4'	111°43.4'	N 2°08.7'	153°54.3'	S 14°51.3'	80°16.9'	N 13°43.1'			
13	135°15.7'	13°22.5'	N 20°12.5'	39°23.5'	N 22°51.4'	126°45.8'	N 2°08.7'	168°56.9'	S 14°51.4'	95°17.7'	N 13°43.6'			
14	150°18.2'	28°22.5'	N 20°12.0'	54°22.7'	N 22°51.4'	141°48.2'	N 2°08.7'	183°59.5'	S 14°51.4'	110°18.6'	N 13°44.1'			
15	165°20.6'	43°22.5'	N 20°11.5'	69°21.9'	N 22°51.4'	156°50.6'	N 2°08.8'	199°02.1'	S 14°51.5'	125°19.4'	N 13°44.7'			
16	180°23.1'	58°22.5'	N 20°11.0'	84°21.1'	N 22°51.4'	171°53.0'	N 2°08.8'	214°04.7'	S 14°51.6'	140°20.2'	N 13°45.2'			
17	195°25.6'	73°22.4'	N 20°10.5'	99°20.2'	N 22°51.4'	186°55.4'	N 2°08.8'	229°07.4'	S 14°51.6'	155°21.1'	N 13°45.7'			
18	210°28.0'	88°22.4'	N 20°10.0'	114°19.4'	N 22°51.4'	201°57.9'	N 2°08.8'	244°10.0'	S 14°51.7'	170°21.9'	N 13°46.2'			
19	225°30.5'	103°22.4'	N 20°09.5'	129°18.6'	N 22°51.4'	217°00.3'	N 2°08.8'	259°12.6'	S 14°51.7'	185°22.7'	N 13°46.7'			
20	240°32.9'	118°22.4'	N 20°09.0'	144°17.8'	N 22°51.3'	232°02.7'	N 2°08.8'	274°15.2'	S 14°51.8'	200°23.6'	N 13°47.3'			
21	255°35.4'	133°22.4'	N 20°08.5'	159°17.0'	N 22°51.3'	247°05.1'	N 2°08.8'	289°17.8'	S 14°51.9'	215°24.4'	N 13°47.8'			
22	270°37.9'	148°22.3'	N 20°08.0'	174°16.1'	N 22°51.3'	262°07.5'	N 2°08.8'	304°20.5'	S 14°51.9'	230°25.2'	N 13°48.3'			
23	285°40.3'	163°22.3'	N 20°07.5'	189°15.3'	N 22°51.3'	277°09.9'	N 2°08.8'	319°23.1'	S 14°52.0'	245°26.1'	N 13°48.8'			
		SD 15.7' d -0.5'		v -0.8' d -0.0'		v 2.4' d 0.0'		v 2.6' d -0.1'		v 0.8' d 0.5'				
Mer. pass.		12 h 6 m 31 s		10 h 22 m		4 h 34 m		1 h 46 m		6 h 39 m				

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Sun	-Rigel	-Capella	-Aldebaran	+Mars	+Jupiter	+Fomalhaut	+Achernar
0	256°45.7'	N 16°01.3'	13.9'	11.4'	55.1'	73°53.8'	43°01.3'	42°44.8'	25°15.7'	4°02.3'	36°40.2'	72°16.7'	74°43.1'
1	271°18.6'	N 16°12.7'	13.8'	11.4'	55.1'	73°25.7'	42°43.2'	42°18.4'	24°46.4'	4°30.5'	37°10.8'	72°46.0'	74°59.4'
2	285°51.4'	N 16°24.1'	13.8'	11.3'	55.1'	72°57.5'	42°25.3'	41°52.1'	24°17.2'	4°58.9'	37°41.3'	73°15.3'	75°15.8'
3	300°24.2'	N 16°35.4'	13.8'	11.2'	55.1'	72°29.4'	42°07.6'	41°25.9'	23°48.1'	5°27.3'	38°11.8'	73°44.6'	75°32.2'
4	314°56.9'	N 16°46.6'	13.7'	11.1'	55.1'	72°01.3'	41°50.2'	40°59.9'	23°19.0'	5°55.8'	38°42.3'	74°13.8'	75°48.7'
5	329°29.7'	N 16°57.7'	13.7'	11.0'	55.0'	71°33.3'	41°32.9'	40°33.9'	22°50.1'	6°24.3'	39°12.8'	74°43.1'	76°05.2'
6	344°02.4'	N 17°08.8'	13.7'	11.0'	55.0'	71°05.3'	41°15.9'	40°08.0'	22°21.2'	6°52.9'	39°43.2'	75°12.3'	76°21.7'
7	358°35.0'	N 17°19.7'	13.6'	10.9'	55.0'	70°37.3'	40°59.1'	39°42.2'	21°52.4'	7°21.5'	40°13.6'	75°41.5'	76°38.3'
8	13°07.6'	N 17°30.6'	13.6'	10.8'	55.0'	70°09.3'	40°42.6'	39°16.6'	21°23.8'	7°50.1'	40°44.0'	76°10.7'	76°54.9'
9	27°40.2'	N 17°41.4'	13.5'	10.7'	54.9'	69°41.3'	40°26.3'	38°51.0'	20°55.2'	8°18.6'	41°14.4'	76°39.9'	77°11.5'
10	42°12.7'	N 17°52.1'	13.5'	10.6'	54.9'	69°13.4'	40°10.2'	38°25.6'	20°26.7'	8°47.2'	41°44.7'	77°09.1'	77°28.2'
11	56°45.3'	N 18°02.7'	13.5'	10.5'	54.9'	68°45.5'	39°54.3'	38°00.3'	19°58.4'	9°15.8'	42°15.1'	77°38.2'	77°44.9'
12	71°17.7'	N 18°13.3'	13.4'	10.5'	54.9'	68°17.6'	39°38.8'	37°35.2'	19°30.1'	9°44.4'	42°45.4'	78°07.3'	78°01.6'
13	85°50.1'	N 18°23.7'	13.4'	10.4'	54.8'	67°49.7'	39°23.4'	37°10.1'	19°02.0'	10°13.0'	43°15.6'	78°36.4'	78°18.4'
14	100°22.5'	N 18°34.1'	13.3'	10.3'	54.8'	67°21.9'		36°45.2'	18°34.1'	10°41.5'	43°45.9'	79°05.5'	78°35.1'
15	114°54.9'	N 18°44.4'	13.3'	10.2'	54.8'	66°54.1'		36°20.5'	18°06.2'	11°10.1'	44°16.1'	79°34.6'	78°51.9'
16	129°27.2'	N 18°54.6'	13.3'	10.1'	54.8'	66°26.3'		35°55.8'	17°38.5'	11°38.6'	44°46.4'	80°03.7'	79°08.7'
17	143°59.5'	N 19°04.7'	13.2'	10.0'	54.8'	65°58.5'		35°31.4'	17°11.0'	12°07.1'	45°16.6'	80°32.7'	79°25.6'
18	158°31.7'	N 19°14.7'	13.2'	9.9'	54.7'	65°30.7'		35°07.0'	16°43.7'	12°35.6'	45°46.7'	81°01.8'	79°42.5'
19	173°03.9'	N 19°24.6'	13.1'	9.8'	54.7'	65°03.0'		34°42.8'	16°16.5'	13°04.1'	46°16.9'	81°30.8'	79°59.4'
20	187°36.0'	N 19°34.5'	13.1'	9.7'	54.7'	64°35.3'		34°18.8'	15°49.6'	13°32.6'	46°47.1'	81°59.8'	80°16.3'
21	202°08.1'	N 19°44.2'	13.1'	9.7'	54.7'	64°07.6'		33°54.9'	15°22.8'	14°01.1'	47°17.2'	82°28.8'	80°33.2'
22	216°40.2'	N 19°53.9'	13.0'	9.6'	54.7'	63°39.9'		33°31.2'	14°56.3'	14°29.5'	47°47.3'	82°57.7'	80°50.1'
23	231°12.2'	N 20°03.5'	13.0'	9.5'	54.6'	63°12.3'		33°07.7'	14°30.0'	14°58.0'	48°17.4'	83°26.7'	81°07.1'
Mer. pass.		7 h 6 m SD 15.0'		phase 36%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.6'	Acrux	+0.8	173°02.6'	S 63°13.6'	Capella	+0.1	280°25.3'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.4'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.2'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°08.1'	N 89°21.2'
Rigil Kent	-0.0	139°42.9'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.0'	Achernar	+0.5	335°21.7'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.7'				
Hadar	+0.6	148°38.8'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	300°42.8'	178°22.3'	N 20°07.0'	204°14.5'	N 22°51.3'	292°12.3'	N 2°08.8'	334°25.7'	S 14°52.0'	260°26.9'	N 13°49.4'	
1	315°45.3'	193°22.3'	N 20°06.5'	219°13.7'	N 22°51.2'	307°14.8'	N 2°08.8'	349°28.3'	S 14°52.1'	275°27.7'	N 13°49.9'	
2	330°47.7'	208°22.3'	N 20°06.0'	234°12.9'	N 22°51.2'	322°17.2'	N 2°08.8'	4°31.0'	S 14°52.2'	290°28.5'	N 13°50.4'	
3	345°50.2'	223°22.2'	N 20°05.5'	249°12.0'	N 22°51.2'	337°19.6'	N 2°08.9'	19°33.6'	S 14°52.2'	305°29.4'	N 13°50.9'	
4	0°52.7'	238°22.2'	N 20°05.0'	264°11.2'	N 22°51.1'	352°22.0'	N 2°08.9'	34°36.2'	S 14°52.3'	320°30.2'	N 13°51.4'	
5	15°55.1'	253°22.2'	N 20°04.4'	279°10.4'	N 22°51.1'	7°24.4'	N 2°08.9'	49°38.8'	S 14°52.3'	335°31.0'	N 13°52.0'	
6	30°57.6'	268°22.2'	N 20°03.9'	294°09.6'	N 22°51.1'	22°26.8'	N 2°08.9'	64°41.4'	S 14°52.4'	350°31.9'	N 13°52.5'	
7	46°00.1'	283°22.2'	N 20°03.4'	309°08.8'	N 22°51.1'	37°29.3'	N 2°08.9'	79°44.1'	S 14°52.5'	5°32.7'	N 13°53.0'	
8	61°02.5'	298°22.1'	N 20°02.9'	324°07.9'	N 22°51.0'	52°31.7'	N 2°08.9'	94°46.7'	S 14°52.5'	20°33.5'	N 13°53.5'	
9	76°05.0'	313°22.1'	N 20°02.4'	339°07.1'	N 22°51.0'	67°34.1'	N 2°08.9'	109°49.3'	S 14°52.6'	35°34.4'	N 13°54.0'	
10	91°07.4'	328°22.1'	N 20°01.9'	354°06.3'	N 22°51.0'	82°36.5'	N 2°08.9'	124°51.9'	S 14°52.6'	50°35.2'	N 13°54.5'	
11	106°09.9'	343°22.1'	N 20°01.4'	9°05.5'	N 22°50.9'	97°38.9'	N 2°08.9'	139°54.6'	S 14°52.7'	65°36.0'	N 13°55.1'	
12	121°12.4'	358°22.1'	N 20°00.9'	24°04.7'	N 22°50.9'	112°41.3'	N 2°08.9'	154°57.2'	S 14°52.7'	80°36.9'	N 13°55.6'	
13	136°14.8'	13°22.1'	N 20°00.3'	39°03.8'	N 22°50.9'	127°43.8'	N 2°08.9'	169°59.8'	S 14°52.8'	95°37.7'	N 13°56.1'	
14	151°17.3'	28°22.0'	N 19°59.8'	54°03.0'	N 22°50.8'	142°46.2'	N 2°08.9'	185°02.4'	S 14°52.9'	110°38.5'	N 13°56.6'	
15	166°19.8'	43°22.0'	N 19°59.3'	69°02.2'	N 22°50.8'	157°48.6'	N 2°08.9'	200°05.0'	S 14°52.9'	125°39.4'	N 13°57.1'	
16	181°22.2'	58°22.0'	N 19°58.8'	84°01.4'	N 22°50.7'	172°51.0'	N 2°08.9'	215°07.7'	S 14°53.0'	140°40.2'	N 13°57.6'	
17	196°24.7'	73°22.0'	N 19°58.3'	99°00.6'	N 22°50.7'	187°53.4'	N 2°08.9'	230°10.3'	S 14°53.0'	155°41.0'	N 13°58.2'	
18	211°27.2'	88°22.0'	N 19°57.8'	113°59.7'	N 22°50.6'	202°55.9'	N 2°08.9'	245°12.9'	S 14°53.1'	170°41.9'	N 13°58.7'	
19	226°29.6'	103°22.0'	N 19°57.2'	128°58.9'	N 22°50.6'	217°58.3'	N 2°08.9'	260°15.5'	S 14°53.2'	185°42.7'	N 13°59.2'	
20	241°32.1'	118°21.9'	N 19°56.7'	143°58.1'	N 22°50.6'	233°00.7'	N 2°09.0'	275°18.2'	S 14°53.2'	200°43.5'	N 13°59.7'	
21	256°34.6'	133°21.9'	N 19°56.2'	158°57.3'	N 22°50.5'	248°03.1'	N 2°09.0'	290°20.8'	S 14°53.3'	215°44.4'	N 14°00.2'	
22	271°37.0'	148°21.9'	N 19°55.7'	173°56.5'	N 22°50.5'	263°05.5'	N 2°09.0'	305°23.4'	S 14°53.3'	230°45.2'	N 14°00.7'	
23	286°39.5'	163°21.9'	N 19°55.2'	188°55.6'	N 22°50.4'	278°08.0'	N 2°09.0'	320°26.0'	S 14°53.4'	245°46.0'	N 14°01.3'	
		SD 15.7' d -0.5'		v -0.8' d -0.0'		v 2.4' d 0.0'		v 2.6' d -0.1'		v 0.8' d 0.5'		
Mer. pass.		12 h 6 m 33 s		10 h 24 m		4 h 30 m		1 h 42 m		6 h 38 m		

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Sun	-Betelgeuse	-Capella	-Aldebaran	+Mars	+Jupiter	+Achernar	+Fomalhaut
0	245°44.2'	N 20°12.9'	12.9'	9.4'	54.6'	62°44.6'	35°24.7'	32°44.3'	14°04.1'	15°26.4'	48°47.4'	81°24.1'	83°55.6'
1	260°16.1'	N 20°22.3'	12.9'	9.3'	54.6'	62°17.0'	34°59.9'	32°21.2'	13°38.4'	15°54.8'	49°17.5'	81°41.1'	84°24.5'
2	274°48.0'	N 20°31.6'	12.8'	9.2'	54.6'	61°49.4'	34°35.3'	31°58.2'	13°13.0'	16°23.2'	49°47.5'	81°58.1'	84°53.4'
3	289°19.9'	N 20°40.8'	12.8'	9.1'	54.6'	61°21.9'	34°10.8'	31°35.4'	12°48.0'	16°51.6'	50°17.6'	82°15.2'	85°22.3'
4	303°51.7'	N 20°49.9'	12.8'	9.0'	54.6'	60°54.3'	33°46.5'	31°12.8'	12°23.3'	17°20.0'	50°47.6'	82°32.2'	85°51.2'
5	318°23.4'	N 20°58.9'	12.7'	8.9'	54.5'	60°26.8'	33°22.3'	30°50.4'	11°59.1'	17°48.3'	51°17.6'	82°49.3'	86°20.1'
6	332°55.1'	N 21°07.8'	12.7'	8.8'	54.5'	59°59.2'	32°58.3'	30°28.2'	11°35.3'	18°16.7'	51°47.5'	83°06.3'	86°48.9'
7	347°26.8'	N 21°16.6'	12.6'	8.7'	54.5'	59°31.7'	32°34.4'	30°06.2'	11°12.1'	18°45.0'	52°17.5'	83°23.4'	87°17.7'
8	1°58.4'	N 21°25.3'	12.6'	8.6'	54.5'	59°04.3'	32°10.7'	29°44.5'	10°49.4'	19°13.3'	52°47.4'	83°40.5'	87°46.5'
9	16°30.0'	N 21°33.9'	12.5'	8.5'	54.5'	58°36.8'	31°47.1'	29°22.9'	10°27.3'	19°41.6'	53°17.3'	83°57.6'	88°15.3'
10	31°01.5'	N 21°42.4'	12.5'	8.4'	54.5'	58°09.3'	31°23.8'	29°01.7'	10°06.0'	20°09.9'	53°47.3'	84°14.8'	88°44.1'
11	45°33.0'	N 21°50.8'	12.4'	8.3'	54.4'	57°41.9'	31°00.6'	28°40.6'		20°38.2'	54°17.1'	84°31.9'	89°12.9'
12	60°04.5'	N 21°59.1'	12.4'	8.2'	54.4'	57°14.5'	30°37.6'	28°19.9'		21°06.4'	54°47.0'	84°49.0'	89°41.7'
13	74°35.9'	N 22°07.3'	12.4'	8.1'	54.4'	56°47.1'	30°14.8'	27°59.3'		21°34.7'	55°16.9'	85°06.2'	90°10.4'
14	89°07.2'	N 22°15.4'	12.3'	8.0'	54.4'	56°19.7'	29°52.2'	27°39.1'		22°02.9'	55°46.8'	85°23.3'	90°39.1'
15	103°38.5'	N 22°23.4'	12.3'	7.9'	54.4'	55°52.3'	29°29.8'	27°19.2'		22°31.1'	56°16.6'	85°40.5'	91°07.9'
16	118°09.8'	N 22°31.3'	12.2'	7.8'	54.4'	55°25.0'	29°07.7'	26°59.5'		22°59.3'	56°46.4'	85°57.6'	91°36.6'
17	132°41.0'	N 22°39.1'	12.2'	7.7'	54.4'	54°57.6'	28°45.7'	26°40.1'		23°27.5'	57°16.2'	86°14.8'	92°05.2'
18	147°12.2'	N 22°46.8'	12.1'	7.6'	54.3'	54°30.3'	28°24.0'	26°21.1'		23°55.7'	57°46.0'	86°32.0'	92°33.9'
19	161°43.3'	N 22°54.3'	12.1'	7.5'	54.3'	54°03.0'	28°02.5'	26°02.4'		24°23.9'	58°15.8'	86°49.1'	93°02.6'
20	176°14.4'	N 23°01.8'	12.0'	7.4'	54.3'	53°35.7'	27°41.3'	25°44.0'		24°52.0'	58°45.6'	87°06.3'	93°31.2'
21	190°45.5'	N 23°09.2'	12.0'	7.3'	54.3'	53°08.4'	27°20.3'	25°25.9'		25°20.2'	59°15.4'	87°23.5'	93°59.9'
22	205°16.5'	N 23°16.4'	12.0'	7.2'	54.3'	52°41.2'	26°59.6'	25°08.2'		25°48.3'	59°45.1'	87°40.7'	94°28.5'
23	219°47.4'	N 23°23.6'	11.9'	7.0'	54.3'	52°13.9'	26°39.1'	24°50.9'		26°16.4'	60°14.9'	87°57.8'	94°57.1'
Mer. pass.		7 h 52 m SD 14.9'		phase 27%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.6'	Acrux	+0.8	173°02.6'	S 63°13.6'	Capella	+0.1	280°25.3'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.4'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.2'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°07.6'	N 89°21.2'
Rigil Kent	-0.0	139°43.0'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.0'	Achernar	+0.5	335°21.7'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.7'				
Hadar	+0.6	148°38.8'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	301°41.9'		178°21.9'	N 19°54.6'	203°54.8'	N 22°50.4'	293°10.4'	N 2°09.0'	335°28.7'	S 14°53.5'	260°46.9'	N 14°01.8'
1	316°44.4'		193°21.9'	N 19°54.1'	218°54.0'	N 22°50.3'	308°12.8'	N 2°09.0'	350°31.3'	S 14°53.5'	275°47.7'	N 14°02.3'
2	331°46.9'		208°21.9'	N 19°53.6'	233°53.2'	N 22°50.3'	323°15.2'	N 2°09.0'	5°33.9'	S 14°53.6'	290°48.6'	N 14°02.8'
3	346°49.3'		223°21.8'	N 19°53.1'	248°52.4'	N 22°50.2'	338°17.7'	N 2°09.0'	20°36.5'	S 14°53.6'	305°49.4'	N 14°03.3'
4	1°51.8'		238°21.8'	N 19°52.5'	263°51.5'	N 22°50.2'	353°20.1'	N 2°09.0'	35°39.1'	S 14°53.7'	320°50.2'	N 14°03.8'
5	16°54.3'		253°21.8'	N 19°52.0'	278°50.7'	N 22°50.1'	8°22.5'	N 2°09.0'	50°41.8'	S 14°53.8'	335°51.1'	N 14°04.3'
6	31°56.7'		268°21.8'	N 19°51.5'	293°49.9'	N 22°50.0'	23°24.9'	N 2°09.0'	65°44.4'	S 14°53.8'	350°51.9'	N 14°04.9'
7	46°59.2'		283°21.8'	N 19°51.0'	308°49.1'	N 22°50.0'	38°27.4'	N 2°09.0'	80°47.0'	S 14°53.9'	5°52.7'	N 14°05.4'
8	62°01.7'		298°21.8'	N 19°50.4'	323°48.3'	N 22°49.9'	53°29.8'	N 2°09.0'	95°49.6'	S 14°53.9'	20°53.6'	N 14°05.9'
9	77°04.1'		313°21.8'	N 19°49.9'	338°47.4'	N 22°49.9'	68°32.2'	N 2°09.0'	110°52.3'	S 14°54.0'	35°54.4'	N 14°06.4'
10	92°06.6'		328°21.8'	N 19°49.4'	353°46.6'	N 22°49.8'	83°34.6'	N 2°09.0'	125°54.9'	S 14°54.1'	50°55.2'	N 14°06.9'
11	107°09.1'		343°21.7'	N 19°48.9'	8°45.8'	N 22°49.7'	98°37.1'	N 2°09.0'	140°57.5'	S 14°54.1'	65°56.1'	N 14°07.4'
12	122°11.5'		358°21.7'	N 19°48.3'	23°45.0'	N 22°49.7'	113°39.5'	N 2°09.0'	156°00.1'	S 14°54.2'	80°56.9'	N 14°07.9'
13	137°14.0'		13°21.7'	N 19°47.8'	38°44.1'	N 22°49.6'	128°41.9'	N 2°09.0'	171°02.8'	S 14°54.2'	95°57.7'	N 14°08.4'
14	152°16.4'		28°21.7'	N 19°47.3'	53°43.3'	N 22°49.5'	143°44.3'	N 2°09.0'	186°05.4'	S 14°54.3'	110°58.6'	N 14°08.9'
15	167°18.9'		43°21.7'	N 19°46.7'	68°42.5'	N 22°49.5'	158°46.8'	N 2°09.0'	201°08.0'	S 14°54.4'	125°59.4'	N 14°09.5'
16	182°21.4'		58°21.7'	N 19°46.2'	83°41.7'	N 22°49.4'	173°49.2'	N 2°09.0'	216°10.6'	S 14°54.4'	141°00.2'	N 14°10.0'
17	197°23.8'		73°21.7'	N 19°45.7'	98°40.9'	N 22°49.3'	188°51.6'	N 2°09.0'	231°13.3'	S 14°54.5'	156°01.1'	N 14°10.5'
18	212°26.3'		88°21.7'	N 19°45.1'	113°40.0'	N 22°49.3'	203°54.0'	N 2°09.0'	246°15.9'	S 14°54.5'	171°01.9'	N 14°11.0'
19	227°28.8'		103°21.7'	N 19°44.6'	128°39.2'	N 22°49.2'	218°56.5'	N 2°09.0'	261°18.5'	S 14°54.6'	186°02.8'	N 14°11.5'
20	242°31.2'		118°21.7'	N 19°44.1'	143°38.4'	N 22°49.1'	233°58.9'	N 2°09.0'	276°21.1'	S 14°54.7'	201°03.6'	N 14°12.0'
21	257°33.7'		133°21.6'	N 19°43.5'	158°37.6'	N 22°49.1'	249°01.3'	N 2°09.0'	291°23.8'	S 14°54.7'	216°04.4'	N 14°12.5'
22	272°36.2'		148°21.6'	N 19°43.0'	173°36.8'	N 22°49.0'	264°03.8'	N 2°09.0'	306°26.4'	S 14°54.8'	231°05.3'	N 14°13.0'
23	287°38.6'		163°21.6'	N 19°42.5'	188°35.9'	N 22°48.9'	279°06.2'	N 2°09.0'	321°29.0'	S 14°54.8'	246°06.1'	N 14°13.5'
			SD 15.7' d -0.5'		v -0.8' d -0.1'		v 2.4' d 0.0'		v 2.6' d -0.1'		v 0.8' d 0.5'	
Mer. pass.			12 h 6 m 34 s		10 h 25 m		4 h 27 m		1 h 38 m		6 h 37 m	

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Sun	-Venus	-Betelgeuse	-Capella	+Aldebaran	+Mars	+Jupiter	+Achernar
0	234°18.3'	N 23°30.6'	11.9'	6.9'	54.3'	51°46.7'	27°53.7'	26°19.0'	24°34.0'		26°44.6'	60°44.6'	88°15.0'
1	248°49.2'	N 23°37.6'	11.8'	6.8'	54.2'	51°19.4'	27°27.3'	25°59.1'	24°17.4'		27°12.7'	61°14.3'	88°32.2'
2	263°20.0'	N 23°44.4'	11.8'	6.7'	54.2'	50°52.2'	27°00.9'	25°39.5'	24°01.3'		27°40.8'	61°44.0'	88°49.4'
3	277°50.8'	N 23°51.1'	11.7'	6.6'	54.2'	50°25.0'	26°34.5'	25°20.3'	23°45.5'		28°08.8'	62°13.7'	89°06.5'
4	292°21.5'	N 23°57.7'	11.7'	6.5'	54.2'	49°57.8'	26°08.2'	25°01.4'			28°36.9'	62°43.4'	89°23.7'
5	306°52.2'	N 24°04.2'	11.6'	6.4'	54.2'	49°30.6'	25°41.8'	24°42.8'			29°05.0'	63°13.1'	89°40.8'
6	321°22.9'	N 24°10.6'	11.6'	6.3'	54.2'	49°03.5'	25°15.5'	24°24.6'			29°33.0'	63°42.8'	89°58.0'
7	335°53.5'	N 24°16.9'	11.6'	6.2'	54.2'	48°36.3'	24°49.2'	24°06.7'			30°01.1'	64°12.4'	90°15.2'
8	350°24.0'	N 24°23.0'	11.5'	6.0'	54.2'	48°09.2'	24°23.0'	23°49.2'			30°29.1'	64°42.1'	90°32.3'
9	4°54.5'	N 24°29.1'	11.5'	5.9'	54.2'	47°42.1'	23°56.7'	23°32.1'			30°57.2'	65°11.7'	90°49.4'
10	19°25.0'	N 24°35.0'	11.4'	5.8'	54.1'	47°14.9'	23°30.5'	23°15.4'			31°25.2'	65°41.4'	91°06.6'
11	33°55.5'	N 24°40.8'	11.4'	5.7'	54.1'	46°47.8'	23°04.3'	22°59.1'			31°53.2'	66°11.0'	91°23.7'
12	48°25.9'	N 24°46.5'	11.4'	5.6'	54.1'	46°20.7'	22°38.1'	22°43.2'			32°21.2'	66°40.6'	91°40.8'
13	62°56.2'	N 24°52.1'	11.3'	5.5'	54.1'	45°53.7'	22°12.0'				32°49.2'	67°10.2'	91°57.9'
14	77°26.5'	N 24°57.5'	11.3'	5.3'	54.1'	45°26.6'	21°45.9'			9°52.0'	33°17.2'	67°39.9'	92°15.0'
15	91°56.8'	N 25°02.9'	11.2'	5.2'	54.1'	44°59.5'	21°19.8'			10°12.7'	33°45.2'	68°09.5'	92°32.1'
16	106°27.1'	N 25°08.1'	11.2'	5.1'	54.1'	44°32.5'	20°53.7'			10°34.1'	34°13.2'	68°39.0'	92°49.1'
17	120°57.3'	N 25°13.2'	11.2'	5.0'	54.1'	44°05.4'	20°27.7'			10°56.0'	34°41.1'	69°08.6'	93°06.2'
18	135°27.4'	N 25°18.2'	11.1'	4.9'	54.1'	43°38.4'	20°01.7'			11°18.6'	35°09.1'	69°38.2'	93°23.2'
19	149°57.6'	N 25°23.1'	11.1'	4.8'	54.1'	43°11.4'	19°35.7'			11°41.7'	35°37.1'	70°07.8'	93°40.3'
20	164°27.7'	N 25°27.9'	11.1'	4.6'	54.1'	42°44.4'	19°09.8'			12°05.2'	36°05.0'	70°37.4'	93°57.3'
21	178°57.7'	N 25°32.5'	11.0'	4.5'	54.0'	42°17.4'	18°43.9'			12°29.2'	36°33.0'	71°06.9'	94°14.3'
22	193°27.7'	N 25°37.0'	11.0'	4.4'	54.0'	41°50.4'	18°18.0'			12°53.5'	37°00.9'	71°36.5'	94°31.2'
23	207°57.7'	N 25°41.4'	11.0'	4.3'	54.0'	41°23.4'	17°52.2'			13°18.2'	37°28.8'	72°06.0'	94°48.2'
Mer. pass.	8 h 40 m	SD 14.8'	phase 19%										

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.6'	Acrux	+0.8	173°02.6'	S 63°13.6'	Capella	+0.1	280°25.2'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.4'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.2'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°07.0'	N 89°21.2'
Rigil Kent	-0.0	139°43.0'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.0'	Achernar	+0.5	335°21.7'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.4'	S 16°44.7'				
Hadar	+0.6	148°38.8'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				



h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	302°41.1'	178°21.6'	N 19°41.9'	203°35.1'	N 22°48.8'	294°08.6'	N 2°09.0'	336°31.6'	S 14°54.9'	261°06.9'	N 14°14.0'			
1	317°43.6'	193°21.6'	N 19°41.4'	218°34.3'	N 22°48.7'	309°11.1'	N 2°09.0'	351°34.3'	S 14°55.0'	276°07.8'	N 14°14.5'			
2	332°46.0'	208°21.6'	N 19°40.9'	233°33.5'	N 22°48.7'	324°13.5'	N 2°09.0'	6°36.9'	S 14°55.0'	291°08.6'	N 14°15.1'			
3	347°48.5'	223°21.6'	N 19°40.3'	248°32.7'	N 22°48.6'	339°15.9'	N 2°09.0'	21°39.5'	S 14°55.1'	306°09.5'	N 14°15.6'			
4	2°50.9'	238°21.6'	N 19°39.8'	263°31.8'	N 22°48.5'	354°18.3'	N 2°09.0'	36°42.1'	S 14°55.1'	321°10.3'	N 14°16.1'			
5	17°53.4'	253°21.6'	N 19°39.3'	278°31.0'	N 22°48.4'	9°20.8'	N 2°09.0'	51°44.8'	S 14°55.2'	336°11.1'	N 14°16.6'			
6	32°55.9'	268°21.6'	N 19°38.7'	293°30.2'	N 22°48.3'	24°23.2'	N 2°09.0'	66°47.4'	S 14°55.3'	351°12.0'	N 14°17.1'			
7	47°58.3'	283°21.6'	N 19°38.2'	308°29.4'	N 22°48.3'	39°25.6'	N 2°09.0'	81°50.0'	S 14°55.3'	6°12.8'	N 14°17.6'			
8	63°00.8'	298°21.6'	N 19°37.6'	323°28.5'	N 22°48.2'	54°28.1'	N 2°09.0'	96°52.7'	S 14°55.4'	21°13.6'	N 14°18.1'			
9	78°03.3'	313°21.6'	N 19°37.1'	338°27.7'	N 22°48.1'	69°30.5'	N 2°09.0'	111°55.3'	S 14°55.5'	36°14.5'	N 14°18.6'			
10	93°05.7'	328°21.5'	N 19°36.6'	353°26.9'	N 22°48.0'	84°32.9'	N 2°09.0'	126°57.9'	S 14°55.5'	51°15.3'	N 14°19.1'			
11	108°08.2'	343°21.5'	N 19°36.0'	8°26.1'	N 22°47.9'	99°35.4'	N 2°09.0'	142°00.5'	S 14°55.6'	66°16.2'	N 14°19.6'			
12	123°10.7'	358°21.5'	N 19°35.5'	23°25.3'	N 22°47.8'	114°37.8'	N 2°09.0'	157°03.2'	S 14°55.6'	81°17.0'	N 14°20.1'			
13	138°13.1'	13°21.5'	N 19°34.9'	38°24.4'	N 22°47.7'	129°40.2'	N 2°09.0'	172°05.8'	S 14°55.7'	96°17.8'	N 14°20.6'			
14	153°15.6'	28°21.5'	N 19°34.4'	53°23.6'	N 22°47.6'	144°42.7'	N 2°09.0'	187°08.4'	S 14°55.8'	111°18.7'	N 14°21.1'			
15	168°18.0'	43°21.5'	N 19°33.8'	68°22.8'	N 22°47.5'	159°45.1'	N 2°09.0'	202°11.0'	S 14°55.8'	126°19.5'	N 14°21.6'			
16	183°20.5'	58°21.5'	N 19°33.3'	83°22.0'	N 22°47.4'	174°47.5'	N 2°09.0'	217°13.7'	S 14°55.9'	141°20.4'	N 14°22.1'			
17	198°23.0'	73°21.5'	N 19°32.8'	98°21.2'	N 22°47.3'	189°50.0'	N 2°09.0'	232°16.3'	S 14°55.9'	156°21.2'	N 14°22.6'			
18	213°25.4'	88°21.5'	N 19°32.2'	113°20.3'	N 22°47.2'	204°52.4'	N 2°09.0'	247°18.9'	S 14°56.0'	171°22.0'	N 14°23.1'			
19	228°27.9'	103°21.5'	N 19°31.7'	128°19.5'	N 22°47.1'	219°54.9'	N 2°09.0'	262°21.5'	S 14°56.1'	186°22.9'	N 14°23.7'			
20	243°30.4'	118°21.5'	N 19°31.1'	143°18.7'	N 22°47.0'	234°57.3'	N 2°09.0'	277°24.2'	S 14°56.1'	201°23.7'	N 14°24.2'			
21	258°32.8'	133°21.5'	N 19°30.6'	158°17.9'	N 22°46.9'	249°59.7'	N 2°09.0'	292°26.8'	S 14°56.2'	216°24.5'	N 14°24.7'			
22	273°35.3'	148°21.5'	N 19°30.0'	173°17.0'	N 22°46.8'	265°02.2'	N 2°09.0'	307°29.4'	S 14°56.2'	231°25.4'	N 14°25.2'			
23	288°37.8'	163°21.5'	N 19°29.5'	188°16.2'	N 22°46.7'	280°04.6'	N 2°09.0'	322°32.1'	S 14°56.3'	246°26.2'	N 14°25.7'			
		SD 15.7' d -0.5'			v -0.8' d -0.1'		v 2.4' d -0.0'		v 2.6' d -0.1'		v 0.8' d 0.5'			
Mer. pass.		12 h 6 m 35 s			10 h 26 m		4 h 23 m		1 h 34 m		6 h 35 m			

h	Moon					Lunar distance							
	GHA	dec	v	d	HP	-Sun	-Procyon	-Pollux	-Venus	+Aldebaran	+Mars	+Jupiter	+Achernar
0	222°27.7'	N 25°45.7'	10.9'	4.2'	54.0'	40°56.4'	39°12.3'	32°27.8'	17°26.4'	13°43.2'	37°56.8'	72°35.6'	95°05.2'
1	236°57.6'	N 25°49.9'	10.9'	4.0'	54.0'	40°29.4'	38°47.8'	31°58.3'	17°00.7'	14°08.5'	38°24.7'	73°05.1'	95°22.1'
2	251°27.5'	N 25°53.9'	10.9'	3.9'	54.0'	40°02.5'	38°23.3'	31°28.8'	16°35.0'	14°34.1'	38°52.6'	73°34.7'	95°39.0'
3	265°57.3'	N 25°57.8'	10.8'	3.8'	54.0'		37°59.0'	30°59.3'	16°09.3'	14°59.8'	39°20.6'	74°04.2'	95°55.9'
4	280°27.2'	N 26°01.6'	10.8'	3.7'	54.0'		37°34.8'	30°29.8'	15°43.7'	15°25.8'	39°48.5'	74°33.7'	96°12.7'
5	294°57.0'	N 26°05.3'	10.8'	3.5'	54.0'		37°10.8'	30°00.3'	15°18.2'	15°52.0'	40°16.4'	75°03.3'	96°29.6'
6	309°26.7'	N 26°08.8'	10.7'	3.4'	54.0'		36°46.8'	29°30.8'	14°52.7'	16°18.4'	40°44.3'	75°32.8'	96°46.4'
7	323°56.5'	N 26°12.2'	10.7'	3.3'	54.0'		36°22.9'	29°01.3'	14°27.3'	16°45.0'	41°12.2'	76°02.3'	97°03.2'
8	338°26.2'	N 26°15.5'	10.7'	3.2'	54.0'		35°59.2'	28°31.8'	14°01.9'	17°11.7'	41°40.1'	76°31.8'	97°20.0'
9	352°55.9'	N 26°18.7'	10.7'	3.0'	54.0'		35°35.6'	28°02.4'	13°36.7'	17°38.6'	42°08.0'	77°01.3'	97°36.7'
10	7°25.5'	N 26°21.7'	10.6'	2.9'	54.0'		35°12.1'	27°32.9'	13°11.5'	18°05.5'	42°35.9'	77°30.8'	97°53.5'
11	21°55.2'	N 26°24.6'	10.6'	2.8'	54.0'		34°48.8'	27°03.5'	12°46.4'	18°32.7'	43°03.8'	78°00.3'	98°10.2'
12	36°24.8'	N 26°27.4'	10.6'	2.7'	54.0'		34°25.6'	26°34.0'	12°21.4'	18°59.9'	43°31.7'	78°29.9'	98°26.9'
13	50°54.4'	N 26°30.1'	10.6'	2.5'	54.0'		34°02.6'	26°04.6'	11°56.5'	19°27.2'	43°59.6'	78°59.4'	98°43.5'
14	65°23.9'	N 26°32.6'	10.5'	2.4'	54.0'		33°39.7'	25°35.1'	11°31.8'	19°54.7'	44°27.5'	79°28.9'	99°00.1'
15	79°53.5'	N 26°35.0'	10.5'	2.3'	53.9'		33°17.0'	25°05.7'	11°07.2'	20°22.2'	44°55.3'	79°58.4'	99°16.7'
16	94°23.0'	N 26°37.3'	10.5'	2.2'	53.9'		32°54.4'	24°36.3'	10°42.7'	20°49.8'	45°23.2'	80°27.9'	99°33.3'
17	108°52.5'	N 26°39.5'	10.5'	2.0'	53.9'		32°32.0'	24°06.9'	10°18.4'	21°17.5'	45°51.1'	80°57.4'	99°49.8'
18	123°22.0'	N 26°41.5'	10.5'	1.9'	53.9'		32°09.7'	23°37.5'	9°54.3'	21°45.3'	46°19.0'	81°26.9'	100°06.3'
19	137°51.4'	N 26°43.4'	10.4'	1.8'	53.9'		31°47.7'	23°08.1'	9°30.4'	22°13.1'	46°46.9'	81°56.4'	100°22.8'
20	152°20.9'	N 26°45.2'	10.4'	1.6'	53.9'		31°25.8'	22°38.7'	9°06.7'	22°41.0'	47°14.8'	82°25.9'	100°39.2'
21	166°50.3'	N 26°46.9'	10.4'	1.5'	53.9'		31°04.1'	22°09.3'	8°43.3'	23°09.0'	47°42.6'	82°55.4'	100°55.6'
22	181°19.8'	N 26°48.4'	10.4'	1.4'	53.9'		30°42.6'	21°39.9'	8°20.2'	23°37.0'	48°10.5'	83°24.9'	101°12.0'
23	195°49.2'	N 26°49.8'	10.4'	1.3'	53.9'		30°21.3'	21°10.5'	7°57.4'	24°05.1'	48°38.4'	83°54.3'	101°28.3'
Mer. pass. 9 h 29 m SD 14.7' phase 12%													

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.6'	Acrux	+0.8	173°02.6'	S 63°13.6'	Capella	+0.1	280°25.2'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.5'
Vega	+0.0	80°34.2'	N 38°48.4'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.2'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°06.4'	N 89°21.2'
Rigil Kent	-0.0	139°43.0'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.0'	Achernar	+0.5	335°21.7'	S 57°07.1'
Arcturus	-0.1	145°49.7'	N 19°04.1'	Sirius	-1.4	258°28.3'	S 16°44.7'				
Hadar	+0.6	148°38.8'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec		GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	303°40.2'	178°21.5'	N 19°28.9'	203°15.4'	N 22°46.6'		295°07.0'	N 2°09.0'	337°34.7'	S 14°56.4'	261°27.1'	N 14°26.2'		
1	318°42.7'	193°21.5'	N 19°28.4'	218°14.6'	N 22°46.5'		310°09.5'	N 2°09.0'	352°37.3'	S 14°56.4'	276°27.9'	N 14°26.7'		
2	333°45.2'	208°21.5'	N 19°27.8'	233°13.8'	N 22°46.4'		325°11.9'	N 2°09.0'		7°39.9'	S 14°56.5'	291°28.7'	N 14°27.2'	
3	348°47.6'	223°21.5'	N 19°27.3'	248°12.9'	N 22°46.3'		340°14.3'	N 2°09.0'		22°42.6'	S 14°56.5'	306°29.6'	N 14°27.7'	
4	3°50.1'	238°21.5'	N 19°26.7'	263°12.1'	N 22°46.2'		355°16.8'	N 2°09.0'		37°45.2'	S 14°56.6'	321°30.4'	N 14°28.2'	
5	18°52.5'	253°21.5'	N 19°26.2'	278°11.3'	N 22°46.1'		10°19.2'	N 2°09.0'		52°47.8'	S 14°56.7'	336°31.3'	N 14°28.7'	
6	33°55.0'	268°21.5'	N 19°25.6'	293°10.5'	N 22°46.0'		25°21.7'	N 2°09.0'		67°50.4'	S 14°56.7'	351°32.1'	N 14°29.2'	
7	48°57.5'	283°21.5'	N 19°25.1'	308°09.7'	N 22°45.9'		40°24.1'	N 2°09.0'		82°53.1'	S 14°56.8'	6°33.0'	N 14°29.7'	
8	63°59.9'	298°21.5'	N 19°24.5'	323°08.8'	N 22°45.7'		55°26.5'	N 2°09.0'		97°55.7'	S 14°56.8'	21°33.8'	N 14°30.2'	
9	79°02.4'	313°21.5'	N 19°24.0'	338°08.0'	N 22°45.6'		70°29.0'	N 2°09.0'		112°58.3'	S 14°56.9'	36°34.6'	N 14°30.7'	
10	94°04.9'	328°21.5'	N 19°23.4'	353°07.2'	N 22°45.5'		85°31.4'	N 2°09.0'		128°01.0'	S 14°57.0'	51°35.5'	N 14°31.2'	
11	109°07.3'	343°21.5'	N 19°22.8'	8°06.4'	N 22°45.4'		100°33.9'	N 2°09.0'		143°03.6'	S 14°57.0'	66°36.3'	N 14°31.7'	
12	124°09.8'	358°21.5'	N 19°22.3'	23°05.6'	N 22°45.3'		115°36.3'	N 2°09.0'		158°06.2'	S 14°57.1'	81°37.2'	N 14°32.2'	
13	139°12.3'	13°21.5'	N 19°21.7'	38°04.7'	N 22°45.2'		130°38.7'	N 2°09.0'		173°08.8'	S 14°57.2'	96°38.0'	N 14°32.7'	
14	154°14.7'	28°21.5'	N 19°21.2'	53°03.9'	N 22°45.0'		145°41.2'	N 2°09.0'		188°11.5'	S 14°57.2'	111°38.8'	N 14°33.2'	
15	169°17.2'	43°21.5'	N 19°20.6'	68°03.1'	N 22°44.9'		160°43.6'	N 2°09.0'		203°14.1'	S 14°57.3'	126°39.7'	N 14°33.7'	
16	184°19.7'	58°21.5'	N 19°20.1'	83°02.3'	N 22°44.8'		175°46.1'	N 2°09.0'		218°16.7'	S 14°57.3'	141°40.5'	N 14°34.2'	
17	199°22.1'	73°21.5'	N 19°19.5'	98°01.4'	N 22°44.7'		190°48.5'	N 2°09.0'		233°19.4'	S 14°57.4'	156°41.4'	N 14°34.7'	
18	214°24.6'	88°21.5'	N 19°18.9'	113°00.6'	N 22°44.5'		205°51.0'	N 2°09.0'		248°22.0'	S 14°57.5'	171°42.2'	N 14°35.2'	
19	229°27.0'	103°21.5'	N 19°18.4'	127°59.8'	N 22°44.4'		220°53.4'	N 2°09.0'		263°24.6'	S 14°57.5'	186°43.1'	N 14°35.7'	
20	244°29.5'	118°21.5'	N 19°17.8'	142°59.0'	N 22°44.3'		235°55.8'	N 2°09.0'		278°27.2'	S 14°57.6'	201°43.9'	N 14°36.2'	
21	259°32.0'	133°21.5'	N 19°17.3'	157°58.2'	N 22°44.2'		250°58.3'	N 2°09.0'		293°29.9'	S 14°57.6'	216°44.7'	N 14°36.7'	
22	274°34.4'	148°21.5'	N 19°16.7'	172°57.3'	N 22°44.0'		266°00.7'	N 2°09.0'		308°32.5'	S 14°57.7'	231°45.6'	N 14°37.1'	
23	289°36.9'	163°21.5'	N 19°16.1'	187°56.5'	N 22°43.9'		281°03.2'	N 2°08.9'		323°35.1'	S 14°57.8'	246°46.4'	N 14°37.6'	
		SD 15.7' d -0.6'		v -0.8' d -0.1'			v 2.4' d -0.0'			v 2.6' d -0.1'		v 0.8' d 0.5'		
Mer. pass.		12 h 6 m 35 s		10 h 28 m			4 h 19 m			1 h 29 m		6 h 34 m		

h	Moon					Lunar distance								
	GHA	dec	v	d	HP	-Procyon	-Pollux	-Venus	+Betelgeuse	+Capella	+Aldebaran	+Rigel	+Mars	
0	210°18.5'	N 26°51.0'	10.4'	1.1'	53.9'	30°00.3'	20°41.1'	7°35.1'			24°33.2'		49°06.3'	
1	224°47.9'	N 26°52.2'	10.4'	1.0'	53.9'	29°39.4'	20°11.8'	7°13.2'			25°01.4'		49°34.2'	
2	239°17.3'	N 26°53.2'	10.4'	0.9'	53.9'	29°18.8'	19°42.4'	6°51.9'			25°29.7'		50°02.0'	
3	253°46.7'	N 26°54.1'	10.4'	0.7'	53.9'	28°58.4'	19°13.1'	6°31.2'			25°57.9'		50°29.9'	
4	268°16.0'	N 26°54.8'	10.3'	0.6'	53.9'	28°38.2'	18°43.7'				26°26.3'		50°57.8'	
5	282°45.4'	N 26°55.4'	10.3'	0.5'	53.9'	28°18.3'	18°14.4'				26°54.6'		51°25.7'	
6	297°14.7'	N 26°55.9'	10.3'	0.4'	53.9'	27°58.6'	17°45.1'			23°24.6'	27°23.0'		51°53.6'	
7	311°44.0'	N 26°56.3'	10.3'	0.2'	53.9'	27°39.3'	17°15.8'			23°39.6'	27°51.5'		52°21.5'	
8	326°13.4'	N 26°56.5'	10.3'	0.1'	53.9'	27°20.2'	16°46.5'			23°55.1'	28°20.0'	39°35.9'	52°49.4'	
9	340°42.7'	N 26°56.6'	10.3'	-0.0'	53.9'	27°01.3'	16°17.2'			24°11.0'	28°48.5'	39°51.0'	53°17.2'	
10	355°12.0'	N 26°56.6'	10.3'	-0.2'	53.9'	26°42.8'	15°48.0'			24°27.2'	29°17.0'	40°06.4'	53°45.1'	
11	9°41.3'	N 26°56.4'	10.3'	-0.3'	53.9'	26°24.6'	15°18.7'			24°43.9'	29°45.6'	40°21.9'	54°13.0'	
12	24°10.6'	N 26°56.2'	10.3'	-0.4'	53.9'	26°06.7'	14°49.5'			25°00.9'	30°14.2'	40°37.7'	54°40.9'	
13	38°40.0'	N 26°55.7'	10.3'	-0.5'	53.9'	25°49.1'	14°20.3'			22°20.3'	25°18.3'	30°42.8'	40°53.6'	55°08.8'
14	53°09.3'	N 26°55.2'	10.3'	-0.7'	53.9'	25°31.9'	13°51.1'			22°35.4'	25°36.0'	31°11.5'	41°09.8'	55°36.7'
15	67°38.6'	N 26°54.5'	10.3'	-0.8'	53.9'	25°15.1'	13°21.9'			22°51.0'	25°54.1'	31°40.2'	41°26.2'	56°04.6'
16	82°07.9'	N 26°53.7'	10.3'	-0.9'	53.9'	24°58.6'	12°52.8'			23°07.0'	26°12.5'	32°08.9'	41°42.8'	56°32.5'
17	96°37.3'	N 26°52.8'	10.3'	-1.1'	53.9'	24°42.4'	12°23.6'			23°23.4'	26°31.2'	32°37.7'	41°59.6'	57°00.5'
18	111°06.6'	N 26°51.7'	10.3'	-1.2'	53.9'	24°26.7'	11°54.6'			23°40.2'	26°50.2'	33°06.4'	42°16.5'	57°28.4'
19	125°36.0'	N 26°50.5'	10.4'	-1.3'	53.9'		11°25.5'			23°57.4'	27°09.5'	33°35.2'	42°33.7'	57°56.3'
20	140°05.3'	N 26°49.2'	10.4'	-1.4'	53.9'		10°56.5'			24°15.0'	27°29.1'	34°04.0'	42°51.0'	58°24.2'
21	154°34.7'	N 26°47.8'	10.4'	-1.6'	53.9'		10°27.6'			24°33.0'	27°49.0'	34°32.9'	43°08.6'	58°52.1'
22	169°04.1'	N 26°46.2'	10.4'	-1.7'	53.9'		9°58.7'			24°51.3'	28°09.1'	35°01.7'	43°26.3'	59°20.1'
23	183°33.5'	N 26°44.5'	10.4'	-1.8'	53.9'		9°29.8'			25°09.9'	28°29.5'	35°30.6'	43°44.1'	59°48.0'
Mer. pass.		10 h 20 m SD 14.7' phase 7%												

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.6'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.6'	Acrux	+0.8	173°02.6'	S 63°13.6'	Capella	+0.1	280°25.2'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.4'
Vega	+0.0	80°34.2'	N 38°48.4'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.1'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°05.8'	N 89°21.2'
Rigel Kent	-0.0	139°43.0'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.0'	Achernar	+0.5	335°21.7'	S 57°07.1'
Arcturus	-0.1	145°49.8'	N 19°04.1'	Sirius	-1.4	258°28.3'	S 16°44.7'				
Hadar	+0.6	148°38.8'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	304°39.4'	178°21.5'	N 19°15.6'	202°55.7'	N 22°43.8'	296°05.6'	N 2°08.9'	338°37.8'	S 14°57.8'	261°47.3'	N 14°38.1'	
1	319°41.8'	193°21.5'	N 19°15.0'	217°54.9'	N 22°43.6'	311°08.1'	N 2°08.9'	353°40.4'	S 14°57.9'	276°48.1'	N 14°38.6'	
2	334°44.3'	208°21.5'	N 19°14.5'	232°54.1'	N 22°43.5'	326°10.5'	N 2°08.9'	8°43.0'	S 14°57.9'	291°49.0'	N 14°39.1'	
3	349°46.8'	223°21.5'	N 19°13.9'	247°53.2'	N 22°43.4'	341°13.0'	N 2°08.9'	23°45.6'	S 14°58.0'	306°49.8'	N 14°39.6'	
4	4°49.2'	238°21.5'	N 19°13.3'	262°52.4'	N 22°43.2'	356°15.4'	N 2°08.9'	38°48.3'	S 14°58.1'	321°50.6'	N 14°40.1'	
5	19°51.7'	253°21.5'	N 19°12.8'	277°51.6'	N 22°43.1'	11°17.9'	N 2°08.9'	53°50.9'	S 14°58.1'	336°51.5'	N 14°40.6'	
6	34°54.2'	268°21.5'	N 19°12.2'	292°50.8'	N 22°43.0'	26°20.3'	N 2°08.9'	68°53.5'	S 14°58.2'	351°52.3'	N 14°41.1'	
7	49°56.6'	283°21.6'	N 19°11.6'	307°50.0'	N 22°42.8'	41°22.8'	N 2°08.9'	83°56.2'	S 14°58.3'	6°53.2'	N 14°41.6'	
8	64°59.1'	298°21.6'	N 19°11.1'	322°49.1'	N 22°42.7'	56°25.2'	N 2°08.9'	98°58.8'	S 14°58.3'	21°54.0'	N 14°42.1'	
9	80°01.5'	313°21.6'	N 19°10.5'	337°48.3'	N 22°42.5'	71°27.6'	N 2°08.9'	114°01.4'	S 14°58.4'	36°54.9'	N 14°42.6'	
10	95°04.0'	328°21.6'	N 19°09.9'	352°47.5'	N 22°42.4'	86°30.1'	N 2°08.9'	129°04.1'	S 14°58.4'	51°55.7'	N 14°43.1'	
11	110°06.5'	343°21.6'	N 19°09.4'	7°46.7'	N 22°42.2'	101°32.5'	N 2°08.9'	144°06.7'	S 14°58.5'	66°56.5'	N 14°43.6'	
12	125°08.9'	358°21.6'	N 19°08.8'	22°45.9'	N 22°42.1'	116°35.0'	N 2°08.9'	159°09.3'	S 14°58.6'	81°57.4'	N 14°44.1'	
13	140°11.4'	13°21.6'	N 19°08.2'	37°45.0'	N 22°41.9'	131°37.4'	N 2°08.9'	174°11.9'	S 14°58.6'	96°58.2'	N 14°44.6'	
14	155°13.9'	28°21.6'	N 19°07.7'	52°44.2'	N 22°41.8'	146°39.9'	N 2°08.9'	189°14.6'	S 14°58.7'	111°59.1'	N 14°45.1'	
15	170°16.3'	43°21.6'	N 19°07.1'	67°43.4'	N 22°41.7'	161°42.3'	N 2°08.8'	204°17.2'	S 14°58.7'	126°59.9'	N 14°45.5'	
16	185°18.8'	58°21.6'	N 19°06.5'	82°42.6'	N 22°41.5'	176°44.8'	N 2°08.8'	219°19.8'	S 14°58.8'	142°00.8'	N 14°46.0'	
17	200°21.3'	73°21.6'	N 19°05.9'	97°41.8'	N 22°41.3'	191°47.2'	N 2°08.8'	234°22.5'	S 14°58.9'	157°01.6'	N 14°46.5'	
18	215°23.7'	88°21.6'	N 19°05.4'	112°40.9'	N 22°41.2'	206°49.7'	N 2°08.8'	249°25.1'	S 14°58.9'	172°02.5'	N 14°47.0'	
19	230°26.2'	103°21.6'	N 19°04.8'	127°40.1'	N 22°41.0'	221°52.1'	N 2°08.8'	264°27.7'	S 14°59.0'	187°03.3'	N 14°47.5'	
20	245°28.7'	118°21.7'	N 19°04.2'	142°39.3'	N 22°40.9'	236°54.6'	N 2°08.8'	279°30.4'	S 14°59.1'	202°04.2'	N 14°48.0'	
21	260°31.1'	133°21.7'	N 19°03.6'	157°38.5'	N 22°40.7'	251°57.0'	N 2°08.8'	294°33.0'	S 14°59.1'	217°05.0'	N 14°48.5'	
22	275°33.6'	148°21.7'	N 19°03.1'	172°37.7'	N 22°40.6'	266°59.5'	N 2°08.8'	309°35.6'	S 14°59.2'	232°05.8'	N 14°49.0'	
23	290°36.0'	163°21.7'	N 19°02.5'	187°36.8'	N 22°40.4'	282°01.9'	N 2°08.8'	324°38.3'	S 14°59.2'	247°06.7'	N 14°49.5'	
		SD 15.7' d -0.6'		v -0.8' d -0.1'		v 2.4' d -0.0'		v 2.6' d -0.1'		v 0.8' d 0.5'		
Mer. pass.		12 h 6 m 34 s		10 h 29 m		4 h 15 m		1 h 25 m		6 h 33 m		

h	Moon				Lunar distance								
	GHA	dec	v	d	HP	-Pollux	+Venus	+Betelgeuse	+Capella	+Aldebaran	+Rigel	+Mars	+Jupiter
0	198°02.9'	N 26°42.6'	10.4'	-2.0'	53.9'	9°01.1'		25°28.9'	28°50.1'	35°59.5'	44°02.2'	60°15.9'	96°12.3'
1	212°32.3'	N 26°40.7'	10.4'	-2.1'	53.9'	8°32.4'		25°48.1'	29°11.0'	36°28.4'	44°20.4'	60°43.9'	96°41.9'
2	227°01.7'	N 26°38.6'	10.4'	-2.2'	53.9'	8°03.9'	6°37.1'	26°07.7'	29°32.1'	36°57.4'	44°38.8'	61°11.8'	97°11.4'
3	241°31.2'	N 26°36.4'	10.5'	-2.3'	53.9'	7°35.5'	6°58.0'	26°27.6'	29°53.4'	37°26.3'	44°57.3'	61°39.8'	97°41.0'
4	256°00.6'	N 26°34.0'	10.5'	-2.5'	53.9'	7°07.2'	7°19.6'	26°47.7'	30°15.0'	37°55.3'	45°16.0'	62°07.7'	98°10.6'
5	270°30.1'	N 26°31.6'	10.5'	-2.6'	53.9'	6°39.1'	7°41.7'	27°08.2'	30°36.7'	38°24.3'	45°34.8'	62°35.7'	98°40.2'
6	284°59.6'	N 26°29.0'	10.5'	-2.7'	53.9'	6°11.3'	8°04.2'	27°28.8'	30°58.7'	38°53.3'	45°53.8'	63°03.7'	99°09.7'
7	299°29.1'	N 26°26.2'	10.5'	-2.9'	53.9'	5°43.7'	8°27.1'	27°49.8'	31°20.8'	39°22.3'	46°13.0'	63°31.6'	99°39.3'
8	313°58.7'	N 26°23.4'	10.6'	-3.0'	54.0'	5°16.5'	8°50.4'	28°10.9'	31°43.1'	39°51.4'	46°32.3'	63°59.6'	100°08.9'
9	328°28.2'	N 26°20.4'	10.6'	-3.1'	54.0'	4°49.8'	9°14.0'	28°32.4'	32°05.7'	40°20.4'	46°51.7'	64°27.6'	100°38.5'
10	342°57.8'	N 26°17.3'	10.6'	-3.2'	54.0'		9°37.8'	28°54.0'	32°28.3'	40°49.5'	47°11.3'	64°55.6'	101°08.1'
11	357°27.4'	N 26°14.1'	10.6'	-3.4'	54.0'		10°01.9'	29°15.8'	32°51.2'	41°18.6'	47°31.0'	65°23.6'	101°37.8'
12	11°57.1'	N 26°10.7'	10.7'	-3.5'	54.0'		10°26.1'	29°37.9'	33°14.2'	41°47.7'	47°50.8'	65°51.6'	102°07.4'
13	26°26.7'	N 26°07.2'	10.7'	-3.6'	54.0'		10°50.6'	30°00.2'	33°37.4'	42°16.8'	48°10.8'	66°19.6'	102°37.0'
14	40°56.4'	N 26°03.6'	10.7'	-3.7'	54.0'		11°15.2'	30°22.6'	34°00.7'	42°46.0'	48°30.9'	66°47.6'	103°06.6'
15	55°26.1'	N 25°59.9'	10.7'	-3.9'	54.0'		11°40.0'	30°45.3'	34°24.2'	43°15.1'	48°51.1'	67°15.6'	103°36.3'
16	69°55.8'	N 25°56.0'	10.8'	-4.0'	54.0'		12°04.9'	31°08.1'	34°47.8'	43°44.3'	49°11.4'	67°43.7'	104°05.9'
17	84°25.6'	N 25°52.0'	10.8'	-4.1'	54.0'		12°29.9'	31°31.1'	35°11.6'	44°13.5'	49°31.9'	68°11.7'	104°35.6'
18	98°55.4'	N 25°47.9'	10.8'	-4.2'	54.0'		12°55.1'	31°54.3'	35°35.5'	44°42.7'	49°52.5'	68°39.7'	105°05.2'
19	113°25.3'	N 25°43.7'	10.9'	-4.3'	54.0'		13°20.3'	32°17.6'	35°59.5'	45°11.9'	50°13.2'	69°07.8'	105°34.9'
20	127°55.1'	N 25°39.4'	10.9'	-4.5'	54.0'		13°45.7'	32°41.1'	36°23.7'	45°41.2'	50°34.0'	69°35.8'	106°04.6'
21	142°25.0'	N 25°34.9'	10.9'	-4.6'	54.0'		14°11.1'	33°04.8'	36°47.9'	46°10.4'	50°55.0'	70°03.9'	106°34.3'
22	156°54.9'	N 25°30.3'	11.0'	-4.7'	54.0'		14°36.6'	33°28.6'	37°12.3'	46°39.7'	51°16.0'	70°32.0'	107°03.9'
23	171°24.9'	N 25°25.6'	11.0'	-4.8'	54.0'								
Mer. pass.		11 h 11 m SD 14.7'		phase 3%									

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.5'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.6'	Acrux	+0.8	173°02.6'	S 63°13.6'	Capella	+0.1	280°25.2'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.1'	S 8°10.4'
Vega	+0.0	80°34.2'	N 38°48.4'	Pollux	+1.2	243°20.2'	N 27°58.4'	Aldebaran	+0.9	290°42.1'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°05.3'	N 89°21.2'
Rigel Kent	-0.0	139°43.0'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.0'	Achernar	+0.5	335°21.6'	S 57°07.1'
Arcturus	-0.1	145°49.8'	N 19°04.1'	Sirius	-1.4	258°28.3'	S 16°44.7'				
Hadar	+0.6	148°38.9'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

Thursday 28 July 2022 UT1

h	Aries		Sun		Venus		Jupiter		Saturn		Mars	
	GHA		GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec
0	305°38.5'		178°21.7'	N 19°01.9'	202°36.0'	N 22°40.3'	297°04.4'	N 2°08.8'	339°40.9'	S 14°59.3'	262°07.5'	N 14°50.0'
1	320°41.0'		193°21.7'	N 19°01.3'	217°35.2'	N 22°40.1'	312°06.9'	N 2°08.8'	354°43.5'	S 14°59.4'	277°08.4'	N 14°50.5'
2	335°43.4'		208°21.7'	N 19°00.8'	232°34.4'	N 22°39.9'	327°09.3'	N 2°08.8'	9°46.1'	S 14°59.4'	292°09.2'	N 14°50.9'
3	350°45.9'		223°21.7'	N 19°00.2'	247°33.6'	N 22°39.8'	342°11.8'	N 2°08.8'	24°48.8'	S 14°59.5'	307°10.1'	N 14°51.4'
4	5°48.4'		238°21.7'	N 18°59.6'	262°32.7'	N 22°39.6'	357°14.2'	N 2°08.7'	39°51.4'	S 14°59.6'	322°10.9'	N 14°51.9'
5	20°50.8'		253°21.7'	N 18°59.0'	277°31.9'	N 22°39.4'	12°16.7'	N 2°08.7'	54°54.0'	S 14°59.6'	337°11.8'	N 14°52.4'
6	35°53.3'		268°21.8'	N 18°58.5'	292°31.1'	N 22°39.3'	27°19.1'	N 2°08.7'	69°56.7'	S 14°59.7'	352°12.6'	N 14°52.9'
7	50°55.8'		283°21.8'	N 18°57.9'	307°30.3'	N 22°39.1'	42°21.6'	N 2°08.7'	84°59.3'	S 14°59.7'	7°13.5'	N 14°53.4'
8	65°58.2'		298°21.8'	N 18°57.3'	322°29.5'	N 22°38.9'	57°24.0'	N 2°08.7'	100°01.9'	S 14°59.8'	22°14.3'	N 14°53.9'
9	81°00.7'		313°21.8'	N 18°56.7'	337°28.6'	N 22°38.8'	72°26.5'	N 2°08.7'	115°04.6'	S 14°59.9'	37°15.2'	N 14°54.4'
10	96°03.1'		328°21.8'	N 18°56.1'	352°27.8'	N 22°38.6'	87°28.9'	N 2°08.7'	130°07.2'	S 14°59.9'	52°16.0'	N 14°54.8'
11	111°05.6'		343°21.8'	N 18°55.6'	7°27.0'	N 22°38.4'	102°31.4'	N 2°08.7'	145°09.8'	S 14°60.0'	67°16.9'	N 14°55.3'
12	126°08.1'		358°21.8'	N 18°55.0'	22°26.2'	N 22°38.3'	117°33.9'	N 2°08.7'	160°12.5'	S 15°00.0'	82°17.7'	N 14°55.8'
13	141°10.5'		13°21.8'	N 18°54.4'	37°25.4'	N 22°38.1'	132°36.3'	N 2°08.7'	175°15.1'	S 15°00.1'	97°18.6'	N 14°56.3'
14	156°13.0'		28°21.9'	N 18°53.8'	52°24.5'	N 22°37.9'	147°38.8'	N 2°08.6'	190°17.7'	S 15°00.2'	112°19.4'	N 14°56.8'
15	171°15.5'		43°21.9'	N 18°53.2'	67°23.7'	N 22°37.7'	162°41.2'	N 2°08.6'	205°20.4'	S 15°00.2'	127°20.2'	N 14°57.3'
16	186°17.9'		58°21.9'	N 18°52.6'	82°22.9'	N 22°37.5'	177°43.7'	N 2°08.6'	220°23.0'	S 15°00.3'	142°21.1'	N 14°57.8'
17	201°20.4'		73°21.9'	N 18°52.1'	97°22.1'	N 22°37.4'	192°46.1'	N 2°08.6'	235°25.6'	S 15°00.4'	157°21.9'	N 14°58.3'
18	216°22.9'		88°21.9'	N 18°51.5'	112°21.3'	N 22°37.2'	207°48.6'	N 2°08.6'	250°28.3'	S 15°00.4'	172°22.8'	N 14°58.7'
19	231°25.3'		103°21.9'	N 18°50.9'	127°20.5'	N 22°37.0'	222°51.1'	N 2°08.6'	265°30.9'	S 15°00.5'	187°23.6'	N 14°59.2'
20	246°27.8'		118°22.0'	N 18°50.3'	142°19.6'	N 22°36.8'	237°53.5'	N 2°08.6'	280°33.5'	S 15°00.5'	202°24.5'	N 14°59.7'
21	261°30.3'		133°22.0'	N 18°49.7'	157°18.8'	N 22°36.6'	252°56.0'	N 2°08.6'	295°36.1'	S 15°00.6'	217°25.3'	N 15°00.2'
22	276°32.7'		148°22.0'	N 18°49.1'	172°18.0'	N 22°36.5'	267°58.4'	N 2°08.6'	310°38.8'	S 15°00.7'	232°26.2'	N 15°00.7'
23	291°35.2'		163°22.0'	N 18°48.5'	187°17.2'	N 22°36.3'	283°00.9'	N 2°08.5'	325°41.4'	S 15°00.7'	247°27.0'	N 15°01.2'
			SD 15.7' d -0.6'		v -0.8' d -0.2'		v 2.5' d -0.0'		v 2.6' d -0.1'		v 0.8' d 0.5'	
Mer. pass.			12 h 6 m 33 s		10 h 30 m		4 h 11 m		1 h 21 m		6 h 31 m	

h	Moon				
	GHA	dec	v	d	HP
0	185°54.9'	N 25°20.7'	11.0'	-5.0'	54.0'
1	200°24.9'	N 25°15.8'	11.1'	-5.1'	54.0'
2	214°55.0'	N 25°10.7'	11.1'	-5.2'	54.0'
3	229°25.1'	N 25°05.5'	11.1'	-5.3'	54.1'
4	243°55.2'	N 25°00.2'	11.2'	-5.4'	54.1'
5	258°25.4'	N 24°54.8'	11.2'	-5.5'	54.1'
6	272°55.7'	N 24°49.2'	11.3'	-5.7'	54.1'
7	287°25.9'	N 24°43.6'	11.3'	-5.8'	54.1'
8	301°56.2'	N 24°37.8'	11.3'	-5.9'	54.1'
9	316°26.6'	N 24°31.9'	11.4'	-6.0'	54.1'
10	330°56.9'	N 24°25.9'	11.4'	-6.1'	54.1'
11	345°27.4'	N 24°19.7'	11.5'	-6.2'	54.1'
12	359°57.8'	N 24°13.5'	11.5'	-6.4'	54.1'
13	14°28.3'	N 24°07.1'	11.6'	-6.5'	54.1'
14	28°58.9'	N 24°00.7'	11.6'	-6.6'	54.1'
15	43°29.5'	N 23°54.1'	11.6'	-6.7'	54.1'
16	58°00.1'	N 23°47.4'	11.7'	-6.8'	54.1'
17	72°30.8'	N 23°40.6'	11.7'	-6.9'	54.2'
18	87°01.6'	N 23°33.7'	11.8'	-7.0'	54.2'
19	101°32.3'	N 23°26.7'	11.8'	-7.1'	54.2'
20	116°03.2'	N 23°19.5'	11.9'	-7.2'	54.2'
21	130°34.0'	N 23°12.3'	11.9'	-7.3'	54.2'
22	145°05.0'	N 23°04.9'	12.0'	-7.5'	54.2'
23	159°35.9'	N 22°57.5'	12.0'	-7.6'	54.2'
Mer. pass.	12 h 0 m SD 14.7'	phase 1%			

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.5'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.6'	Acrux	+0.8	173°02.6'	S 63°13.6'	Capella	+0.1	280°25.2'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.0'	S 8°10.4'
Vega	+0.0	80°34.2'	N 38°48.4'	Pollux	+1.2	243°20.1'	N 27°58.4'	Aldebaran	+0.9	290°42.1'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°04.8'	N 89°21.2'
Rigil Kent	-0.0	139°43.0'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.0'	Achernar	+0.5	335°21.6'	S 57°07.1'
Arcturus	-0.1	145°49.8'	N 19°04.1'	Sirius	-1.4	258°28.3'	S 16°44.7'				
Hadar	+0.6	148°38.9'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	306°37.6'	178°22.0'	N 18°47.9'	202°16.4'	N 22°36.1'	298°03.4'	N 2°08.5'	340°44.0'	S 15°00.8'	262°27.9'	N 15°01.6'			
1	321°40.1'	193°22.0'	N 18°47.4'	217°15.5'	N 22°35.9'	313°05.8'	N 2°08.5'	355°46.7'	S 15°00.9'	277°28.7'	N 15°02.1'			
2	336°42.6'	208°22.1'	N 18°46.8'	232°14.7'	N 22°35.7'	328°08.3'	N 2°08.5'	10°49.3'	S 15°00.9'	292°29.6'	N 15°02.6'			
3	351°45.0'	223°22.1'	N 18°46.2'	247°13.9'	N 22°35.5'	343°10.7'	N 2°08.5'	25°51.9'	S 15°01.0'	307°30.4'	N 15°03.1'			
4	6°47.5'	238°22.1'	N 18°45.6'	262°13.1'	N 22°35.3'	358°13.2'	N 2°08.5'	40°54.6'	S 15°01.0'	322°31.3'	N 15°03.6'			
5	21°50.0'	253°22.1'	N 18°45.0'	277°12.3'	N 22°35.1'	13°15.7'	N 2°08.5'	55°57.2'	S 15°01.1'	337°32.1'	N 15°04.1'			
6	36°52.4'	268°22.1'	N 18°44.4'	292°11.5'	N 22°34.9'	28°18.1'	N 2°08.5'	70°59.8'	S 15°01.2'	352°33.0'	N 15°04.5'			
7	51°54.9'	283°22.1'	N 18°43.8'	307°10.6'	N 22°34.7'	43°20.6'	N 2°08.4'	86°02.5'	S 15°01.2'	7°33.8'	N 15°05.0'			
8	66°57.4'	298°22.2'	N 18°43.2'	322°09.8'	N 22°34.5'	58°23.1'	N 2°08.4'	101°05.1'	S 15°01.3'	22°34.7'	N 15°05.5'			
9	81°59.8'	313°22.2'	N 18°42.6'	337°09.0'	N 22°34.3'	73°25.5'	N 2°08.4'	116°07.7'	S 15°01.4'	37°35.5'	N 15°06.0'			
10	97°02.3'	328°22.2'	N 18°42.0'	352°08.2'	N 22°34.2'	88°28.0'	N 2°08.4'	131°10.4'	S 15°01.4'	52°36.4'	N 15°06.5'			
11	112°04.8'	343°22.2'	N 18°41.4'	7°07.4'	N 22°34.0'	103°30.4'	N 2°08.4'	146°13.0'	S 15°01.5'	67°37.2'	N 15°06.9'			
12	127°07.2'	358°22.2'	N 18°40.8'	22°06.6'	N 22°33.8'	118°32.9'	N 2°08.4'	161°15.6'	S 15°01.5'	82°38.1'	N 15°07.4'			
13	142°09.7'	13°22.3'	N 18°40.2'	37°05.7'	N 22°33.5'	133°35.4'	N 2°08.4'	176°18.3'	S 15°01.6'	97°38.9'	N 15°07.9'			
14	157°12.1'	28°22.3'	N 18°39.7'	52°04.9'	N 22°33.3'	148°37.8'	N 2°08.4'	191°20.9'	S 15°01.7'	112°39.8'	N 15°08.4'			
15	172°14.6'	43°22.3'	N 18°39.1'	67°04.1'	N 22°33.1'	163°40.3'	N 2°08.3'	206°23.5'	S 15°01.7'	127°40.6'	N 15°08.9'			
16	187°17.1'	58°22.3'	N 18°38.5'	82°03.3'	N 22°32.9'	178°42.8'	N 2°08.3'	221°26.2'	S 15°01.8'	142°41.5'	N 15°09.3'			
17	202°19.5'	73°22.3'	N 18°37.9'	97°02.5'	N 22°32.7'	193°45.2'	N 2°08.3'	236°28.8'	S 15°01.8'	157°42.4'	N 15°09.8'			
18	217°22.0'	88°22.4'	N 18°37.3'	112°01.7'	N 22°32.5'	208°47.7'	N 2°08.3'	251°31.4'	S 15°01.9'	172°43.2'	N 15°10.3'			
19	232°24.5'	103°22.4'	N 18°36.7'	127°00.8'	N 22°32.3'	223°50.2'	N 2°08.3'	266°34.1'	S 15°02.0'	187°44.1'	N 15°10.8'			
20	247°26.9'	118°22.4'	N 18°36.1'	142°00.0'	N 22°32.1'	238°52.6'	N 2°08.3'	281°36.7'	S 15°02.0'	202°44.9'	N 15°11.3'			
21	262°29.4'	133°22.4'	N 18°35.5'	156°59.2'	N 22°31.9'	253°55.1'	N 2°08.3'	296°39.3'	S 15°02.1'	217°45.8'	N 15°11.7'			
22	277°31.9'	148°22.4'	N 18°34.9'	171°58.4'	N 22°31.7'	268°57.6'	N 2°08.2'	311°42.0'	S 15°02.2'	232°46.6'	N 15°12.2'			
23	292°34.3'	163°22.5'	N 18°34.3'	186°57.6'	N 22°31.5'	284°00.0'	N 2°08.2'	326°44.6'	S 15°02.2'	247°47.5'	N 15°12.7'			
		SD 15.7' d -0.6'		v -0.8' d -0.2'		v 2.5' d -0.0'		v 2.6' d -0.1'		v 0.9' d 0.5'				
Mer. pass.		12 h 6 m 32 s		10 h 32 m		4 h 7 m		1 h 17 m		6 h 30 m				

h	Moon				Lunar distance							
	GHA	dec	v	d	HP	-Antares	-Rigil Kent	-Hadar	-Acrux	-Spica	-Arcturus	-Regulus
0	174°06.9'	N 22°49.9'	12.1'	-7.7'	54.2'							
1	188°38.0'	N 22°42.3'	12.1'	-7.8'	54.2'							
2	203°09.1'	N 22°34.5'	12.2'	-7.9'	54.2'							
3	217°40.3'	N 22°26.6'	12.2'	-8.0'	54.3'							
4	232°11.5'	N 22°18.6'	12.3'	-8.1'	54.3'							
5	246°42.7'	N 22°10.5'	12.3'	-8.2'	54.3'							
6	261°14.0'	N 22°02.3'	12.4'	-8.3'	54.3'							
7	275°45.4'	N 21°54.1'	12.4'	-8.4'	54.3'							
8	290°16.8'	N 21°45.7'	12.5'	-8.5'	54.3'							
9	304°48.2'	N 21°37.2'	12.5'	-8.6'	54.3'							
10	319°19.7'	N 21°28.6'	12.5'	-8.7'	54.3'							
11	333°51.3'	N 21°19.9'	12.6'	-8.8'	54.3'							
12	348°22.9'	N 21°11.1'	12.6'	-8.9'	54.3'							
13	2°54.5'	N 21°02.2'	12.7'	-9.0'	54.4'	115°06.8'	104°04.0'	99°50.9'	92°09.1'	69°13.4'	69°42.5'	15°34.1'
14	17°26.2'	N 20°53.2'	12.7'	-9.1'	54.4'	114°36.7'	103°42.0'	99°29.4'	91°51.1'	68°43.4'	69°16.6'	15°05.3'
15	31°58.0'	N 20°44.2'	12.8'	-9.2'	54.4'	114°06.7'	103°20.0'	99°07.8'	91°33.1'	68°13.4'	68°50.7'	14°36.6'
16	46°29.8'	N 20°35.0'	12.8'	-9.3'	54.4'	113°36.6'	102°57.9'	98°46.2'	91°15.0'	67°43.3'	68°24.8'	14°08.0'
17	61°01.6'	N 20°25.7'	12.9'	-9.4'	54.4'	113°06.5'	102°35.8'	98°24.6'	90°57.0'	67°13.3'	67°59.0'	13°39.5'
18	75°33.5'	N 20°16.4'	12.9'	-9.4'	54.4'	112°36.4'	102°13.6'	98°02.9'	90°38.9'	66°43.2'	67°33.2'	13°11.1'
19	90°05.5'	N 20°06.9'	13.0'	-9.5'	54.4'	112°06.2'	101°51.5'	97°41.2'	90°20.9'	66°13.2'	67°07.4'	12°42.8'
20	104°37.4'	N 19°57.4'	13.0'	-9.6'	54.4'	111°36.1'	101°29.2'	97°19.5'	90°02.8'	65°43.1'	66°41.6'	12°14.6'
21	119°09.5'	N 19°47.8'	13.1'	-9.7'	54.5'	111°06.0'	101°07.0'	96°57.8'	89°44.7'	65°13.0'	66°15.8'	11°46.6'
22	133°41.6'	N 19°38.0'	13.1'	-9.8'	54.5'	110°35.8'	100°44.7'	96°36.0'	89°26.6'	64°42.9'	65°50.1'	11°18.8'
23	148°13.7'	N 19°28.2'	13.2'	-9.9'	54.5'	110°05.6'	100°22.4'	96°14.2'	89°08.5'	64°12.8'	65°24.4'	10°51.1'
Mer. pass.		12 h 48 m SD 14.8'		phase 0%								

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.5'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.5'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.6'	Acrux	+0.8	173°02.7'	S 63°13.6'	Capella	+0.1	280°25.2'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.0'	S 8°10.4'
Vega	+0.0	80°34.2'	N 38°48.4'	Pollux	+1.2	243°20.1'	N 27°58.4'	Aldebaran	+0.9	290°42.1'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°04.3'	N 89°21.2'
Rigil Kent	-0.0	139°43.0'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.0'	Achernar	+0.5	335°21.6'	S 57°07.1'
Arcturus	-0.1	145°49.8'	N 19°04.1'	Sirius	-1.4	258°28.3'	S 16°44.7'				
Hadar	+0.6	148°38.9'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.3'				

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	307°36.8'	178°22.5'	N 18°33.7'	201°56.8'	N 22°31.3'	299°02.5'	N 2°08.2'	341°47.2'	S 15°02.3'	262°48.3'	N 15°13.2'			
1	322°39.3'	193°22.5'	N 18°33.1'	216°55.9'	N 22°31.0'	314°05.0'	N 2°08.2'	356°49.9'	S 15°02.3'	277°49.2'	N 15°13.6'			
2	337°41.7'	208°22.5'	N 18°32.5'	231°55.1'	N 22°30.8'	329°07.4'	N 2°08.2'	11°52.5'	S 15°02.4'	292°50.0'	N 15°14.1'			
3	352°44.2'	223°22.6'	N 18°31.9'	246°54.3'	N 22°30.6'	344°09.9'	N 2°08.2'	26°55.2'	S 15°02.5'	307°50.9'	N 15°14.6'			
4	7°46.6'	238°22.6'	N 18°31.3'	261°53.5'	N 22°30.4'	359°12.4'	N 2°08.2'	41°57.8'	S 15°02.5'	322°51.7'	N 15°15.1'			
5	22°49.1'	253°22.6'	N 18°30.6'	276°52.7'	N 22°30.2'	14°14.8'	N 2°08.1'	57°00.4'	S 15°02.6'	337°52.6'	N 15°15.5'			
6	37°51.6'	268°22.6'	N 18°30.0'	291°51.9'	N 22°29.9'	29°17.3'	N 2°08.1'	72°03.1'	S 15°02.7'	352°53.4'	N 15°16.0'			
7	52°54.0'	283°22.7'	N 18°29.4'	306°51.1'	N 22°29.7'	44°19.8'	N 2°08.1'	87°05.7'	S 15°02.7'	7°54.3'	N 15°16.5'			
8	67°56.5'	298°22.7'	N 18°28.8'	321°50.2'	N 22°29.5'	59°22.3'	N 2°08.1'	102°08.3'	S 15°02.8'	22°55.1'	N 15°17.0'			
9	82°59.0'	313°22.7'	N 18°28.2'	336°49.4'	N 22°29.3'	74°24.7'	N 2°08.1'	117°11.0'	S 15°02.8'	37°56.0'	N 15°17.4'			
10	98°01.4'	328°22.7'	N 18°27.6'	351°48.6'	N 22°29.1'	89°27.2'	N 2°08.1'	132°13.6'	S 15°02.9'	52°56.9'	N 15°17.9'			
11	113°03.9'	343°22.8'	N 18°27.0'	6°47.8'	N 22°28.8'	104°29.7'	N 2°08.0'	147°16.2'	S 15°03.0'	67°57.7'	N 15°18.4'			
12	128°06.4'	358°22.8'	N 18°26.4'	21°47.0'	N 22°28.6'	119°32.1'	N 2°08.0'	162°18.9'	S 15°03.0'	82°58.6'	N 15°18.9'			
13	143°08.8'	13°22.8'	N 18°25.8'	36°46.2'	N 22°28.4'	134°34.6'	N 2°08.0'	177°21.5'	S 15°03.1'	97°59.4'	N 15°19.3'			
14	158°11.3'	28°22.8'	N 18°25.2'	51°45.4'	N 22°28.1'	149°37.1'	N 2°08.0'	192°24.1'	S 15°03.2'	113°00.3'	N 15°19.8'			
15	173°13.7'	43°22.9'	N 18°24.6'	66°44.5'	N 22°27.9'	164°39.6'	N 2°08.0'	207°26.8'	S 15°03.2'	128°01.1'	N 15°20.3'			
16	188°16.2'	58°22.9'	N 18°24.0'	81°43.7'	N 22°27.7'	179°42.0'	N 2°08.0'	222°29.4'	S 15°03.3'	143°02.0'	N 15°20.8'			
17	203°18.7'	73°22.9'	N 18°23.4'	96°42.9'	N 22°27.4'	194°44.5'	N 2°07.9'	237°32.0'	S 15°03.4'	158°02.8'	N 15°21.2'			
18	218°21.1'	88°23.0'	N 18°22.8'	111°42.1'	N 22°27.2'	209°47.0'	N 2°07.9'	252°34.7'	S 15°03.4'	173°03.7'	N 15°21.7'			
19	233°23.6'	103°23.0'	N 18°22.1'	126°41.3'	N 22°27.0'	224°49.5'	N 2°07.9'	267°37.3'	S 15°03.5'	188°04.6'	N 15°22.2'			
20	248°26.1'	118°23.0'	N 18°21.5'	141°40.5'	N 22°26.7'	239°51.9'	N 2°07.9'	282°39.9'	S 15°03.5'	203°05.4'	N 15°22.6'			
21	263°28.5'	133°23.0'	N 18°20.9'	156°39.7'	N 22°26.5'	254°54.4'	N 2°07.9'	297°42.6'	S 15°03.6'	218°06.3'	N 15°23.1'			
22	278°31.0'	148°23.1'	N 18°20.3'	171°38.8'	N 22°26.3'	269°56.9'	N 2°07.9'	312°45.2'	S 15°03.7'	233°07.1'	N 15°23.6'			
23	293°33.5'	163°23.1'	N 18°19.7'	186°38.0'	N 22°26.0'	284°59.3'	N 2°07.8'	327°47.9'	S 15°03.7'	248°08.0'	N 15°24.1'			
		SD 15.7' d -0.6'		v -0.8' d -0.2'		v 2.5' d -0.0'		v 2.6' d -0.1'		v 0.9' d 0.5'				
Mer. pass.		12 h 6 m 30 s		10 h 33 m		4 h 3 m		1 h 13 m		6 h 28 m				

h	Moon					Lunar distance						
	GHA	dec	v	d	HP	-Antares	-Rigel Kent	-Hadar	-Acrux	-Arcturus	-Spica	-Regulus
0	162°45.9'	N 19°18.3'	13.2'	-10.0'	54.5'	109°35.4'	100°00.0'	95°52.4'	88°50.4'	64°58.7'	63°42.7'	10°23.7'
1	177°18.1'	N 19°08.3'	13.3'	-10.1'	54.5'	109°05.2'	99°37.6'	95°30.6'	88°32.3'	64°33.0'	63°12.5'	9°56.5'
2	191°50.4'	N 18°58.3'	13.3'	-10.2'	54.5'	108°35.0'	99°15.2'	95°08.7'	88°14.2'	64°07.3'	62°42.4'	9°29.7'
3	206°22.8'	N 18°48.1'	13.4'	-10.2'	54.5'	108°04.8'	98°52.8'	94°46.8'	87°56.1'	63°41.7'	62°12.2'	9°03.1'
4	220°55.1'	N 18°37.9'	13.4'	-10.3'	54.5'	107°34.6'	98°30.3'	94°24.9'	87°38.0'	63°16.1'	61°42.0'	8°37.0'
5	235°27.6'	N 18°27.5'	13.5'	-10.4'	54.6'	107°04.3'	98°07.8'	94°03.0'	87°19.8'	62°50.5'	61°11.8'	8°11.3'
6	250°00.0'	N 18°17.1'	13.5'	-10.5'	54.6'	106°34.0'	97°45.2'	93°41.0'	87°01.7'	62°25.0'	60°41.6'	7°46.2'
7	264°32.6'	N 18°06.6'	13.6'	-10.6'	54.6'	106°03.8'	97°22.7'	93°19.1'	86°43.6'	61°59.5'	60°11.4'	7°21.7'
8	279°05.1'	N 17°56.0'	13.6'	-10.7'	54.6'	105°33.5'	97°00.1'	92°57.1'	86°25.5'	61°34.0'	59°41.2'	
9	293°37.7'	N 17°45.4'	13.7'	-10.7'	54.6'	105°03.1'	96°37.5'	92°35.1'	86°07.4'	61°08.5'	59°10.9'	
10	308°10.4'	N 17°34.6'	13.7'	-10.8'	54.6'	104°32.8'	96°14.9'	92°13.1'	85°49.3'	60°43.1'	58°40.7'	
11	322°43.1'	N 17°23.8'	13.7'	-10.9'	54.6'	104°02.5'	95°52.2'	91°51.1'	85°31.2'	60°17.7'	58°10.4'	
12	337°15.9'	N 17°12.9'	13.8'	-11.0'	54.7'	103°32.1'	95°29.5'	91°29.0'	85°13.0'	59°52.4'	57°40.1'	
13	351°48.7'	N 17°01.9'	13.8'	-11.1'	54.7'	103°01.8'	95°06.8'	91°07.0'	84°55.0'	59°27.0'	57°09.8'	
14	6°21.5'	N 16°50.9'	13.9'	-11.1'	54.7'	102°31.4'	94°44.1'	90°44.9'	84°36.9'	59°01.8'	56°39.5'	
15	20°54.4'	N 16°39.7'	13.9'	-11.2'	54.7'	102°01.0'	94°21.3'	90°22.8'	84°18.8'	58°36.5'	56°09.2'	
16	35°27.3'	N 16°28.5'	14.0'	-11.3'	54.7'	101°30.6'	93°58.6'	90°00.7'	84°00.7'	58°11.3'	55°38.9'	
17	50°00.3'	N 16°17.2'	14.0'	-11.4'	54.7'	101°00.1'	93°35.8'	89°38.6'	83°42.6'	57°46.2'	55°08.5'	
18	64°33.3'	N 16°05.9'	14.1'	-11.4'	54.7'	100°29.7'	93°13.0'	89°16.5'	83°24.6'	57°21.0'	54°38.2'	
19	79°06.3'	N 15°54.4'	14.1'	-11.5'	54.8'	99°59.2'	92°50.1'	88°54.4'	83°06.5'	56°56.0'	54°07.8'	
20	93°39.4'	N 15°42.9'	14.1'	-11.6'	54.8'	99°28.7'	92°27.3'	88°32.2'	82°48.5'	56°30.9'	53°37.4'	
21	108°12.5'	N 15°31.4'	14.2'	-11.6'	54.8'	98°58.2'	92°04.4'	88°10.1'	82°30.5'	56°05.9'	53°07.0'	
22	122°45.7'	N 15°19.7'	14.2'	-11.7'	54.8'	98°27.7'	91°41.6'	87°47.9'	82°12.5'	55°41.0'	52°36.6'	
23	137°18.9'	N 15°08.0'	14.3'	-11.8'	54.8'	97°57.2'	91°18.7'	87°25.8'	81°54.5'	55°16.1'	52°06.1'	
Mer. pass.		13 h 34 m SD 14.9'		phase 2%								

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.4'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.5'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.6'	Acrux	+0.8	173°02.7'	S 63°13.6'	Capella	+0.1	280°25.2'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.0'	S 8°10.4'
Vega	+0.0	80°34.2'	N 38°48.4'	Pollux	+1.2	243°20.1'	N 27°58.4'	Aldebaran	+0.9	290°42.1'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°03.8'	N 89°21.2'
Rigel Kent	-0.0	139°43.0'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.0'	Achernar	+0.5	335°21.6'	S 57°07.1'
Arcturus	-0.1	145°49.8'	N 19°04.1'	Sirius	-1.4	258°28.3'	S 16°44.7'				
Hadar	+0.6	148°38.9'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.2'				

Sunday 31 July 2022 UT1

h	Aries			Sun			Venus		Jupiter		Saturn		Mars	
	GHA	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	GHA	dec	
0	308°35.9'	178°23.1'	N 18°19.1'	201°37.2'	N 22°25.8'	300°01.8'	N 2°07.8'	342°50.5'	S 15°03.8'	263°08.8'	N 15°24.5'			
1	323°38.4'	193°23.2'	N 18°18.5'	216°36.4'	N 22°25.5'	315°04.3'	N 2°07.8'	357°53.1'	S 15°03.9'	278°09.7'	N 15°25.0'			
2	338°40.9'	208°23.2'	N 18°17.8'	231°35.6'	N 22°25.3'	330°06.8'	N 2°07.8'	12°55.8'	S 15°03.9'	293°10.5'	N 15°25.5'			
3	353°43.3'	223°23.2'	N 18°17.2'	246°34.8'	N 22°25.0'	345°09.3'	N 2°07.8'	27°58.4'	S 15°04.0'	308°11.4'	N 15°25.9'			
4	8°45.8'	238°23.2'	N 18°16.6'	261°34.0'	N 22°24.8'	0°11.7'	N 2°07.7'	43°01.0'	S 15°04.0'	323°12.3'	N 15°26.4'			
5	23°48.2'	253°23.3'	N 18°16.0'	276°33.2'	N 22°24.5'	15°14.2'	N 2°07.7'	58°03.7'	S 15°04.1'	338°13.1'	N 15°26.9'			
6	38°50.7'	268°23.3'	N 18°15.4'	291°32.3'	N 22°24.3'	30°16.7'	N 2°07.7'	73°06.3'	S 15°04.2'	353°14.0'	N 15°27.4'			
7	53°53.2'	283°23.3'	N 18°14.8'	306°31.5'	N 22°24.1'	45°19.2'	N 2°07.7'	88°08.9'	S 15°04.2'	8°14.8'	N 15°27.8'			
8	68°55.6'	298°23.4'	N 18°14.1'	321°30.7'	N 22°23.8'	60°21.6'	N 2°07.7'	103°11.6'	S 15°04.3'	23°15.7'	N 15°28.3'			
9	83°58.1'	313°23.4'	N 18°13.5'	336°29.9'	N 22°23.6'	75°24.1'	N 2°07.6'	118°14.2'	S 15°04.4'	38°16.5'	N 15°28.8'			
10	99°00.6'	328°23.4'	N 18°12.9'	351°29.1'	N 22°23.3'	90°26.6'	N 2°07.6'	133°16.8'	S 15°04.4'	53°17.4'	N 15°29.2'			
11	114°03.0'	343°23.5'	N 18°12.3'	6°28.3'	N 22°23.0'	105°29.1'	N 2°07.6'	148°19.5'	S 15°04.5'	68°18.3'	N 15°29.7'			
12	129°05.5'	358°23.5'	N 18°11.7'	21°27.5'	N 22°22.8'	120°31.6'	N 2°07.6'	163°22.1'	S 15°04.5'	83°19.1'	N 15°30.2'			
13	144°08.0'	13°23.5'	N 18°11.0'	36°26.7'	N 22°22.5'	135°34.0'	N 2°07.6'	178°24.8'	S 15°04.6'	98°20.0'	N 15°30.6'			
14	159°10.4'	28°23.6'	N 18°10.4'	51°25.8'	N 22°22.3'	150°36.5'	N 2°07.5'	193°27.4'	S 15°04.7'	113°20.8'	N 15°31.1'			
15	174°12.9'	43°23.6'	N 18°09.8'	66°25.0'	N 22°22.0'	165°39.0'	N 2°07.5'	208°30.0'	S 15°04.7'	128°21.7'	N 15°31.6'			
16	189°15.4'	58°23.6'	N 18°09.2'	81°24.2'	N 22°21.8'	180°41.5'	N 2°07.5'	223°32.7'	S 15°04.8'	143°22.6'	N 15°32.0'			
17	204°17.8'	73°23.7'	N 18°08.6'	96°23.4'	N 22°21.5'	195°44.0'	N 2°07.5'	238°35.3'	S 15°04.9'	158°23.4'	N 15°32.5'			
18	219°20.3'	88°23.7'	N 18°07.9'	111°22.6'	N 22°21.2'	210°46.4'	N 2°07.5'	253°37.9'	S 15°04.9'	173°24.3'	N 15°33.0'			
19	234°22.7'	103°23.7'	N 18°07.3'	126°21.8'	N 22°21.0'	225°48.9'	N 2°07.4'	268°40.6'	S 15°05.0'	188°25.1'	N 15°33.4'			
20	249°25.2'	118°23.8'	N 18°06.7'	141°21.0'	N 22°20.7'	240°51.4'	N 2°07.4'	283°43.2'	S 15°05.1'	203°26.0'	N 15°33.9'			
21	264°27.7'	133°23.8'	N 18°06.1'	156°20.2'	N 22°20.4'	255°53.9'	N 2°07.4'	298°45.9'	S 15°05.1'	218°26.9'	N 15°34.4'			
22	279°30.1'	148°23.8'	N 18°05.4'	171°19.4'	N 22°20.2'	270°56.4'	N 2°07.4'	313°48.5'	S 15°05.2'	233°27.7'	N 15°34.8'			
23	294°32.6'	163°23.9'	N 18°04.8'	186°18.6'	N 22°19.9'	285°58.8'	N 2°07.4'	328°51.1'	S 15°05.2'	248°28.6'	N 15°35.3'			
		SD 15.7' d -0.6'		v -0.8' d -0.3'		v 2.5' d -0.0'		v 2.6' d -0.1'		v 0.9' d 0.5'				
Mer. pass.		12 h 6 m 27 s		10 h 34 m		3 h 59 m		1 h 8 m		6 h 27 m				

h	Moon					Lunar distance						
	GHA	dec	v	d	HP	-Antares	-Rigel Kent	-Hadar	-AcruX	-Arcturus	-Spica	+Regulus
0	151°52.2'	N 14°56.2'	14.3'	-11.9'	54.8'	97°26.7'	90°55.8'	87°03.6'	81°36.5'	54°51.3'	51°35.7'	
1	166°25.5'	N 14°44.4'	14.3'	-11.9'	54.9'	96°56.1'	90°32.8'	86°41.5'	81°18.5'	54°26.5'	51°05.2'	
2	180°58.8'	N 14°32.4'	14.4'	-12.0'	54.9'	96°25.5'	90°09.9'	86°19.3'	81°00.6'	54°01.8'	50°34.8'	
3	195°32.2'	N 14°20.5'	14.4'	-12.1'	54.9'	95°55.0'	89°47.0'	85°57.1'	80°42.7'	53°37.1'	50°04.3'	
4	210°05.6'	N 14°08.4'	14.4'	-12.1'	54.9'	95°24.4'	89°24.0'	85°34.9'	80°24.7'	53°12.5'	49°33.8'	
5	224°39.0'	N 13°56.3'	14.5'	-12.2'	54.9'	94°53.7'	89°01.0'	85°12.7'	80°06.9'	52°47.9'	49°03.2'	
6	239°12.5'	N 13°44.1'	14.5'	-12.2'	54.9'	94°23.1'	88°38.1'	84°50.6'	79°49.0'	52°23.4'	48°32.7'	
7	253°46.0'	N 13°31.9'	14.5'	-12.3'	55.0'	93°52.4'	88°15.1'	84°28.4'	79°31.1'	51°59.0'	48°02.2'	7°43.7'
8	268°19.5'	N 13°19.6'	14.6'	-12.4'	55.0'	93°21.8'	87°52.1'	84°06.2'	79°13.3'	51°34.6'	47°31.6'	8°09.1'
9	282°53.1'	N 13°07.2'	14.6'	-12.4'	55.0'	92°51.1'	87°29.0'	83°44.0'	78°55.5'	51°10.3'	47°01.0'	8°35.1'
10	297°26.7'	N 12°54.7'	14.6'	-12.5'	55.0'	92°20.4'	87°06.0'	83°21.8'	78°37.8'	50°46.1'	46°30.4'	9°01.6'
11	312°00.3'	N 12°42.3'	14.7'	-12.6'	55.0'	91°49.6'	86°43.0'	82°59.6'	78°20.0'	50°21.9'	45°59.8'	9°28.5'
12	326°34.0'	N 12°29.7'	14.7'	-12.6'	55.0'	91°18.9'	86°20.0'	82°37.5'	78°02.3'	49°57.9'	45°29.2'	9°55.9'
13	341°07.7'	N 12°17.1'	14.7'	-12.7'	55.1'	90°48.1'	85°56.9'	82°15.3'	77°44.6'	49°33.8'	44°58.6'	10°23.5'
14	355°41.4'	N 12°04.4'	14.8'	-12.7'	55.1'	90°17.4'	85°33.9'	81°53.1'	77°27.0'	49°09.9'	44°27.9'	10°51.5'
15	10°15.2'	N 11°51.7'	14.8'	-12.8'	55.1'	89°46.6'	85°10.9'	81°31.0'	77°09.3'	48°46.1'	43°57.3'	11°19.7'
16	24°49.0'	N 11°38.9'	14.8'	-12.8'	55.1'	89°15.8'	84°47.8'	81°08.8'	76°51.7'	48°22.3'	43°26.6'	11°48.1'
17	39°22.8'	N 11°26.1'	14.8'	-12.9'	55.1'	88°44.9'	84°24.7'	80°46.7'	76°34.2'	47°58.6'	42°55.9'	12°16.8'
18	53°56.6'	N 11°13.2'	14.9'	-12.9'	55.2'	88°14.1'	84°01.7'	80°24.5'	76°16.7'	47°35.1'	42°25.2'	12°45.6'
19	68°30.5'	N 11°00.3'	14.9'	-13.0'	55.2'	87°43.2'	83°38.6'	80°02.4'	75°59.2'	47°11.6'	41°54.4'	13°14.7'
20	83°04.4'	N 10°47.3'	14.9'	-13.0'	55.2'	87°12.3'	83°15.6'	79°40.3'	75°41.7'	46°48.2'	41°23.7'	13°43.8'
21	97°38.3'	N 10°34.2'	14.9'	-13.1'	55.2'	86°41.4'	82°52.5'	79°18.2'	75°24.3'	46°24.9'	40°53.0'	14°13.1'
22	112°12.2'	N 10°21.1'	15.0'	-13.1'	55.2'	86°10.5'	82°29.5'	78°56.1'	75°06.9'	46°01.7'	40°22.2'	14°42.5'
23	126°46.2'	N 10°08.0'	15.0'	-13.2'	55.2'	85°39.6'	82°06.4'	78°34.0'	74°49.6'	45°38.6'	39°51.4'	15°12.1'
Mer. pass.		14 h 18 m SD 15.0'		phase 5%								

Star	mag	SHA	dec	Star	mag	SHA	dec	Star	mag	SHA	dec
Fomalhaut	+1.2	15°16.4'	S 29°30.1'	Spica	+1.0	158°24.5'	S 11°16.7'	Betelgeuse	+0.5	270°54.5'	N 7°24.7'
Deneb	+1.2	49°26.7'	N 45°21.6'	AcruX	+0.8	173°02.7'	S 63°13.6'	Capella	+0.1	280°25.2'	N 46°01.1'
Altair	+0.8	62°01.6'	N 8°55.7'	Regulus	+1.4	207°36.9'	N 11°51.6'	Rigel	+0.2	281°06.0'	S 8°10.4'
Vega	+0.0	80°34.2'	N 38°48.4'	Pollux	+1.2	243°20.1'	N 27°58.4'	Aldebaran	+0.9	290°42.1'	N 16°33.2'
Antares	+1.1	112°18.1'	S 26°28.9'	Procyon	+0.4	244°53.3'	N 5°10.1'	Polaris	+2.0	315°03.4'	N 89°21.2'
Rigel Kent	-0.0	139°43.0'	S 60°55.9'	Adhara	+1.5	255°07.8'	S 29°00.0'	Achernar	+0.5	335°21.6'	S 57°07.1'
Arcturus	-0.1	145°49.8'	N 19°04.1'	Sirius	-1.4	258°28.3'	S 16°44.7'				
Hadar	+0.6	148°38.9'	S 60°29.1'	Canopus	-0.6	263°53.8'	S 52°42.2'				